

ALAGAPPA UNIVERSITY

(Accredited with 'A+' Grade by NAAC)
Karaikudi - 630 003. TAMILNADU



DIRECTORATE OF DISTANCE EDUCATION

182

M.B.A. (B & F)



PAPER - 4.2
INVESTMENT ANALYSIS AND PORTFOLIO MANAGEMENT

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Investment Analysis and Portfolio Management

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Paper 3.4

INVESTMENT ANALYSIS & PORTFOLIO MANAGEMENT

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REFERENCE BOOKS:

1. Investment: Analysis and Management : J.C. Francis
2. Management of Investment : J.C. Francis

Course Material Prepared By

P. Natarajan

LESSON – 1

INVESTMENT ANALYSIS AND PORTFOLIO MANAGEMENT

Introduction

Investment is the sacrifice of current liquidity or current rupees or current dollars for future liquidity, future rupees or future dollars. There are different concepts and types of investment. In detail, all these concepts and types of investment are dealt in this lesson.

Concepts of investment

There are two concepts of investment, viz, the economic concept and the financial concept.

The economic concept of investment refers to investment as "expenditures on new plants, machinery, capital equipment and so forth, with the hope of making added wealth". To make added wealth, the rate of return on the investment must be more than the real cost of capital. Suppose, one estimated that his investment in the above referred to assets is giving him a real rate of return of 15.5% p.a and his nominal cost of capital is 20% inflation being 10%. The real cost of capital is given by nominal cost – inflation rate = 20% - 10% = 10%. Then, the investor makes a net wealth addition to the extent of I(1+r) / (1+K*)-I, Where I = original investment, r = real rate of return and K* = real cost of capital. If we assume an I = Rs. 100 mn, then

Wealth addition = Rs. 100 mn (1+15.5%) / (1+10%) – Rs. 100 mn
= Rs. 100mn (1.155) / (1.1) – Rs. 100 mn
= Rs. 105 mn – Rs. 100 mn = Rs.5 mn

The economic concept of investment is wealth creation oriented and that depends on Return on investment (r) and real cost of capital (K*). Only if $r > K^*$ wealth addition results. If $r = K^*$, neither wealth addition nor wealth depletion results. If $r < K^*$, wealth depletion takes places.

The financial concept of investment refers to investment as. "commitment of funds in financial assets with the hope of getting current income in the form of dividend or interest and / or capital gain". It is nothing but sacrificing certain present consumption for a hoped for enhanced future consumption. Put otherwise, investment is postponement of consumption. That is. "savings" are considered as investment. Savings can be in any form. A farmer produces 100 bags of paddy, but consumes only 40 bags of paddy and difference is his savings and hence his investment. A salaried employee earning Rs.2 lakh p.a and his consumption expenditure is Rs.1.5 lakhs and hence his savings Rs.50,000 amount to investment which may be in the form of undrawn bank balance, shares, debentures, gold, National Savings Certificates. Etc.

GOALS OF INVESTMENT

Whatever may be the nature of investment, whether it is economic or financial, It has lot of motives. They are as follows:

1. Get decent current income
2. Obtain reasonable capital gain
3. Benefit from tax-off
4. Right to participate in growth
5. Reduce risk, given overall return

6. Maximise return, given risk
7. Ensure safety of investment
8. Provide for liquidity of investment
9. Easy transferability
10. Preference of pledgeability
11. Protection for future
12. Beat the inflation
13. Sense of participation in national economic development
14. Fulfilment of security, social and esteem needs
15. Economic power

Let us explain each of these goals to an extent.

Get decent current income

Current income is the periodic (monthly, quarterly, semi-annual or annual) return in the form of interest or dividend or party-pay back. Usually debt investments or some mutual funds or some life policies give / guarantee periodic income. Shares of companies with unbroken dividend income.

Current income is surer than future income, as it is analogous to "a bird in hand", as against "two in the bush". Current income is desired by risk-averters, small investors, income mutual funds and such featured investors. Tax benefit u/s 80L is available for current income.

Obtain reasonable capital gain

Capital appreciation is net value addition. If it is available in addition to current income, it is double welcome for investors. Tax benefit u/s 48(2) is

available for capital gain, after indexation for inflation. Capital gain is bit riskier as it involves a peep into the future which is beset with uncertainty and risk. Shares in growth companies, good turnaround shares, shares in leveraged buy-outs, shares in successful venture schemes, convertible debentures in blue-chips, global depository and American Depository receipts of growth concerns, zero coupon bonds, deep discount bonds, growth mutual funds, etc promise capital gain. Big investors and risk-seeking investors, prefer capital gain to current income.

Benefit through tax-off

Investors prefer tax-benefit coated investments. Income Tax Act Provisions 80L and 48(2) give tax concessions for current and capital incomes respectively. besides, tax benefit on investment committed is also available U/s 88 of the IT Act, investments in NSC, NSS, 10/15 years P.O savings schemes, LIC policies, Mediclaim policies, PF, PPF, SPF, GIS, equity-committed mutual funds schemes, investment in self-occupied house property to the extent principle repaid, limited to Rs.10,000 at the maximum out of income, on loans taken for house construction, etc qualify for tax rebate. Salaried employees in India find this tax-benefit really alluring. The one exception is equity related mutual fund schemes which have now gone fade. There are no investors. And hence no floaters, of late.

Pre-emptive right to participate in growth firms

If a blue-chip company goes to expand, the additional fresh equity capital required to fund expansion is first sought from existing shareholders, giving them a chance to participate in the company's growth. The shares are

issued at discount to market price and that for existing shareholders such "rights" offers, are real bonanza. One has to be at least a moderate sized investor, if not big, to benefit from right offers. Of course, rights can be sold in full or part and that all shareholders can benefit. To "rights" holders capital gain results, as well as current income, as their shareholding base is a bit increased.

Reduce risk, given return

The dominant goal of investors is to optimise return and risk. Return is the sum total of all benefits expressed annualised % figures. Risk is the std-deviation, ie., fluctuation, of the returns. As investments are made in plural number of securities, it is possible to reduce risk, without a fall in the overall return. This is what investors aspire for.

Increase return, given risk

A corollary of the previous goal is, maximise return, keeping risk at constant level. Like the previous one, this goal is possible when one goes for a portfolio of investment.

Ensure safety of investment

Safety of principal is very important. Return of capital invested in fact at least must be granted. Return of capital is more important than return on capital. Many a stocks are quoting below par, not at all quoted and hence not saleable or quote at below issue price. In these cases, where is safety of capital? Even if principal is in tact, inflation reduces the real value of principals sum. Govt. securities (also called as "gilts"), bank deposits, blue-chip bonds/shares,

etc ensure safety of investment. The fly-by-night finance companies are black-sheep who cheat guillible investors. All investors need safety of principal. If that is not ensured, the whole of capital market system shall go out-of-gear and rubbish.

Provide for liquidity

Investment is postponement of consumption. It is not permanent postponement. So, when needed the investment must be realisable in cash without loss of time and value. Bank deposits generally have liquidity. Gilts have liquidity, Bluechip shares have liquidity. Gold has liquidity. All the rest have limited or no liquidity. Unquoted shares, delisted shares, etc virtually have no liquidity. All investors need liquidity of their investments.

Easy transferability

Easy transferability refers to minimum procedures, less paper work, no stamp duty, no-recourse, etc. Perhaps bearer bonds are easiest to transfer. For listed scrips the procedure laid out for share/bond transfer is to be followed. Delay must be avoided.

Preference for pledgeability

Pledgeability refers to abiiity to raise fund on the collateral of the investment held. Most investments have this. But volatile shocks have less pledgeability.

Protection for future

Investment is to facilitate and provide for future consumption of the investor and / or his kith and kin. So, one of the investment objectives is to provide for the future.

Beat the inflation

As inflation is inevitable, to suffer not value decrease cash holdings, bank balances, etc be reduces and investment in value-adding investment alternatives is required. Even bonds may not help beating inflation, only growth shares like the MNC scrips, like the sun-rise industries scrips, performing growth mutual funds and convertible scrips can beat inflation 1.2. 13 Sense of nation building.

Investments determine economic growth. Higher investment lead to higher economic growth leading to more employment, more income, more savings and more investment. This is a virtuous cycle. So, investors have the feeling and rightfully at that, of participation in the economic building of the nation.

Fulfilment of social, esteem needs

Through investment, the investor concerned ensures his and his family's security, which leads to greater social liking against family and other members and this in turn leads to fulfilment of the esteem needs. True big investor feel esteemed about themselves. They are respected. They weiled social power.

Economic Power

Finally, investment goal is to gain the economic power. Spread your investments. Spread your economic power. Foreign institutional investors have gained great economic power in our country and our bourses dance to their tunes. Similarly, foreign direct investment, NRI investment, etc given them the economic power What is true for institutions, is true for individuals also. Through investments, through interlocking investments, one can command economic power at will.

Goal multiplicity and conflicts

Investment goals are multiple. This multiplicity eventually lead to conflict among goals. If you want current income capital gain is not be expected much and vice versa. Tax benefit coated investments moderate other benefits. Now that companies price "rights" issues close to market price which is somewhat rigged just prior to and until the currency of offer period, the benefits of rights issues are bookish rather than a practicable. The monetary policy of the Central Bank is influenced by the powers that be, which cause variations in returns. And this happens at least twice (normally) in a year when credit policy for lean and busy seasons are announced. So, risk-return optimisation is hindered, officially speaking, but yet in a nothing official style. The liquidity of investments has become a topic limited to some 500 scrips only, which 100 times more this number of scrips are in place. And liquidity comes against safety of capital.

But, goal congruity does exist. Ultimately return maximisation and risk minimisation and the professed goals.

TYPES OF INVESTMENT

Investment types are infinity. We can put them in five major types. viz financial, real, business, personal and institutional. These are dealt below.

Financial investments

Financial investments as were already presented involve commitment of funds in financial and monetary assets.

Several financial investment instruments are available. Financial and business investment is broad classification of investment alternatives. The former is security oriented, while the latter is entrepreneurial. We are concerned with financial investments which involve investment in financial assets like bank deposit. bond of government life insurance policy. provident fund contribution mutual fund, chit fund, contribution, shares, debentures, etc.

From the point of view of institutions with which we commit funds, risk involved in investments and on other bases we can classify investment alternatives.

From the point of view of institutions with which we commit funds investments may be classified as investment in public sector institution may be of risk and risk tree type. Investment in public sector banks deposits. in governments bonds, in public provident fund. life insurance policy. public sector bonds. etc. are risk free. whereas investments in shares of public sector units and units of mutual funds are risky. Investment in private sector

institutions include investment in shares, debentures, mutual funds, etc. All these are risky type.

Risk and Risk free investments:

Risky investments generally give high fluctuating return, both current return in the form of interest and dividend and capital appreciation. Risk free investment give less but stable return. Risk averse people prefer risk-free investments such as government bonds, NSC, bank deposits, high rated (AAA, AA+) bonds, Units with safety net, life policies, GPF,PPF,KVP,IVP, etc. Risk seeking investors go for shares, convertible bonds, warrants, open end mutual funds etc.

Tax benefit and non-tax benefit investments:

Certain investments give tax benefits. Investment in PPF,GPF,LIC policies, mediclaim policies, NSC, unit linked insurance scheme, NSS, deposits in 10 year and 154 year P.O Savings bank (cumulative time deposits) etc upto Rs.50000 p.a (Rs.60000 in the case of artists, professionals etc.) qualify for a tax rebate of 20% similarly subscription upto Rs.10000 in any tax rebate of 20% on sum so invested. Other investments do not provide this sort of tax benefit. Interest income get section 80L benefit, while dividend is tax-free.

Security and non-security investments:

Security investments refer to commitment of funds in equity shares, preference shares, convertible and non-convertible debentures, warrants, traded mutual fund units, etc. The title to the investments are tradeable in stock

market. Non-security investments are investments in life policies, bank deposits, public deposits, NSC,NSS,KVP,IVP, non-tradeable mutual fund units, post office time deposits, GPF,PPF, etc, These are not traded in stock exchanged. That is, there in no secondary market. However, the interest in these investments can be assigned. Repayment takes place normally at maturity.

Investment alternatives in the primary & secondary security markets:

Primary market investment alternatives include fresh issue shares, debentures, bonds, units etc. Here institutions concerned raise capital by floating these instruments afresh. To the extent of money mobilised capitalisation takes place. Once these securities are listed with stock exchanges, purchases and sales among investors constitute the secondary market. The demand and supply in both the primary and secondary security markets affect each other.

Investment in shares, bonds, etc, is known as primary investments. Options and futures are known as derivative instruments. Here right to by /sell shares/ bonds is traded and not the shares/bonds. Value or 'right' depends on value of the shares/bonds. Hence the name 'derivative' instruments.

Financial investment alternatives:

Shares as an investment alternative is risky. Dividend is the mode of current return. Good companies give interim dividend besides annual dividend. Their shares also command high price giving good capital gain. Such concerns are known as 'blue-chip' companies. On the other end there are companies

which are not regular in dividend payment. Also their shares do not command good price. Shares fluctuate in value and that only those who sell during peak price book capital gain and only those who buy during depression gain. Shares with lower P-E ratio are good 'buy' candidates, provided there is liquidity, while those with higher P-E ratio are good 'sell' candidates. shares give the benefits of 'rights' issue participation and 'bonus shares' issues.

Equity securities from the investment point of view are classified as blue-chip (well established, strong companies shares) growth stocks (shares of companies whose sales, profit, EPS, value, etc are growing faster than the rate of growth of GDP),income stocks (high dividend payout shares) speculative scrips (whose vales fluctuate widely) defensive stocks (whose prices flucutate less) cyclical stocks vary in value in tune with the business cycle, and glamour stocks with unbroken, high dividend rate. Equity investments can be classified in terms of their beta a measure of rate and direction of change in return for a given change in the return of the market as a whole. Accordingly aggressive stocks (beta vale is more than 1.5) conservative stocks (beta value is less than 0.5) and hedge stocks (beta value is around 1) are the different classes of equity scrips. Debentures are debt instrument. May be these are secured or unsecured some are convertible into equity fully or partly depending on terms of issue periodic interest payment, fixed rate floating over bank deposit rate, are issued by certain concerns like the State Bank of India. There is no capital appreciation Debentures with maturity exceeding 18 months should be rated by credit rating agencies like CRISIL, ICRA or CARE. High rated debentures carry low interest rate as risk is low and vice versa.

Bank deposits are of different type – savings, recurring and time Rate of interest is low for savings deposits and is high for time or fixed deposits. Risk free, generally, are bank deposits. So, return is lower and bank deposits suit risk averse investors.

Company deposits are deposits with companies who are allowed to accepts deposit for a period not less than a year, and not more than 3 years by manufacturing companies and 6 years by non-banking finance companies. Rate of interest is higher than bank rate. But risk is high. RBI controls deposits taking by companies by stipulating interest ceiling, period and quantum of deposits.

Mutual funds are pooling of small savings of large population and collectively investing the pooled funds in capital and money market securities. UTI was the pioneer mutual fund. Unit Scheme 1964, Unit Linked Insurance Scheme 1971, Children Gift Plan 1970, Capital Gains Unit Scheme 1983, etc., are popular schemes. Later in late 1980s, banks and since 1993 private concerns were allowed to float mutual funds. There are many schemes, as much as 250, available now. Some are income oriented, some capital appreciation oriented, some are tax benefit oriented, some are mixed purpose oriented and so on. There are open-end and close-end schemes. Open end schemes are without limit as to size and maturity time. These are bought and sold continuously by the sponsors throughout. UTI 64 is an open-end scheme Close-end schemes are fixed as to maturity and corpus of the fund. Risk minimisation is the goal of mutual fund. The goals remains, however, in paper only.

Life policies are savings with an insurance cover. Though the return is lower, the benefit of insurance cover is laudable.

GPF/PPF are personal savings plan giving about 12% p.a return. They are risk-free. They do give tax benefit of 25% of sum invested. Hence tax benefit weighed return comes to 15% p.a or so.

NSS/NSC are again personal savings giving 11 to 12% return. After tax benefit is considered effective return comes to around 14 to 15% p.a. Absolutely risk free, these are.

IVP/KVP are personal savings which double in about 5 years giving a simple return of 20% p.a. Absolutely risk free, these are.

Post office deposit schemes are risk free, but return is lower. P.O.Cumulative deposit (10 and 15 year) schemes also give tax benefit.

Warrants are rights go get shares or convertible debentures when the same are floated by the company at a future date. Depending on the price of the shares, warrants command a price. Say one warrant is needed to a buy a share whose market value is Rs.100, but likely to be sold at a concessional price of Rs.90. Then each warrant will have a price about Rs.10. (ie: Rs.100-90).

Public sector bonds are issued by public sector units. Both taxable and non-taxable bonds are in vogue. The interest rate in the former is higher than that of the latter.

Public sector shares are now available with selective privatisation of public sector. SAIL, SBI, IFCI, IDBI and several other public sector concerns shares are available. They are as risky as shares of private companies and so in the return on them.

CHARACTERS OF FINANCIAL INSTRUMENTS

Character of different financial instruments are tabled below:

Character	Financial Instrument
1. Current return	Shares, debentures, income mutual funds, public deposits, fixed deposits, etc.
2. Capital gain	Shares, convertible bonds, growth funds etc.
3. Tax benefit	Tax rebate on investment in NSS, NSC, GPF, PPF, Taxplan mutual funds. Capital gain tax is at less rate after adjustment for inflation and equity scrips have this benefit. Current income is also taxed only after a basic exemption of Rs. 13,000. Ali forms of investment have one other form of tax benefit. Dividend now is not lated at the recipient's hands.
4. Risk	Fluctuation in return is high in equity scrips and that risk is higher. Among bonds / debentures AAA, AA, & A rated bonds are less riskier. Moderate risk is involved in BBB, BB & B rated bonds. Other bonds are high in risk. Govt. securities and bank deposits are less riskier. Mutual funds are riskier though of less quantity.
5. Management rights	Only equity instruments provide management rights to holders.

6. Liquidity	Security type instruments and listed securities have liquidity. Equity shares, debentures, etc have liquidity.
7. Transferability	Security type investments are transferable through transfer deeds. Others are ssignable through nomination facility.
	8. Pledgeability Most securities are pledgeable.
9. Safety	Bank deposit and Govt. Scrips have maximum safety of principal. High rated bonds also have a good amount of safety. All other instruments have less safety.
10. Insurance Cover	Insurance policies only offer this cover. Certain mutual funds like the Unit Linked Insurance Plan, also have this feature.

REAL INVESTMENTS

Real investments are investment in real assets like real-estates in the form of land plots, housing plots, residential complexes, commercial complexes, etc. We can also bring infrastructural assets that are privately developed and made commercially available for users. Real investments in the form of gold, silver bullion, precious stones, ornaments, made thereof are pavery popular. Every country makes an official gold hold. Indian's per capita gold consumption is highest the world over. Real investments in the form of souvenir collectibles like art, antiques, coins and stamps exist.

Real investments to beat inflation

Real investments help beating inflation. They are inflation-hedges, unlike monetary assets bank deposits, govt-bonds, etc. The annual returns on Gold, Stamps, Diamonds and old collectibles ran between 9.1 to 16.% in the USA for the time period 1970-85, While during the same period monetary assets fetched returns ranging between 2% and 9%. Landed property gives the highest of returns in India and elsewhere. And if it happens to be urban land, the value seems doubling every year. That is 100% return, while inflation is under 10%. In the recent times real estate business is highly flourishing. Gold, once considered better to put one's hard earned savings, pales yellow before land investment in Real estate developers require a tract of land, convert into plots with approval of appropriate local body authorities and sells or builds commercial / residential flats and sells. The return is enormous. Even the real estate brokers make very good return. With virtually no investment at all. Theirs is a "knowledge" business. Perfect hedge against inflation is in the landed property investment.

Regular Income

If you want regular income, still it is possible. Let out your commercial and residential complexes. In the commercial complexes, even the construction cost you can recover as interest free refundable deposits from the complex occupants under the guise "advance". In pivatal locations there is no bearing between the monthly rent and the "advance". You have created a life-long monthly income giving asset. Urbanisation is the cause behind the above effect.

A detailed account of real investments types is provided as follows.

Real estates

Diamonds. Pearls. Sapphire and other coloured stones. and other precious stones are greatly demanded world over. India is famous for the "navratnas" – the nine previous stones of which diamond. pearls. are widely traded. They serve as store of value they are durable; they can be cut into smaller ones and get highly valuable. they can be owned anonymous: they are fungible. ie.. interchangeable and they can be authenticated.

Precious metals

Next to precious stones come. precious metals like gold. silver. magnesium. maganese. molybdenum. nickel. platinum, titanium. etc. Gold and silver outsmart the others because of their superior qualities. The other metals are industrial metals actually. The London Metals Exchange is famous for metals trade as a benchmark.

Gold and silver can be bullion. ie.. bar form or as coins or as ornaments. The banking system perhaps hold bullion stocks, but people prefer to hold ornaments. Pledgeability. liquidity. etc make gold and silver as good investments. Gold bond are in vogue where against gold surrendered. bonds are issued and latter when bonds are redeemed gold is returned. This is to activate the private gold and carries low interest or to unearth black money. "Black" gets converted into "yellow" and becomes "white".

Art goods

Art goods creations with aesthetic values. Creative brains, skilled hands, dextrous fingers and deep reverence stand behind art goods. Art goods are bought by households, institutions, museums, art investors, art collectors and other art lovers. In metros, art market flourish. As a dealer or trade in art goods one can expect to make periodic return and capital gain as well.

Collectibles

Collectibles are diverse in nature. These range from dolls to stamps, from rare coins to antiques (like plates), from idols to juice boxes and so on. .hese have face value (in the case of coins, stamps), intrinsic value (in the case coins, idols, etc) and numisonatic value (value arising from rarity). Investments in these collectives have to be held for longer period before these can be redeemed. In the case of stamps for years and years. The brokerage is also high.

BUSINESS INVESTMENTS

Business investments are entrepreneurial investment. We may call business investments as economic investments. Here income is generated through processing, conversion, value addition. Investment in fixed assets of a business like land, building, plant, machinery, furniture, fixtures, captive facilities like power or water plants, etc and in current assets such as rawmaterial, working progress, finished goods, accounts receivable, bank balance, etc constitute business investment.

PERSONAL INVESTMENTS

Personal investment goals of investors. An investor might need life cover more than return, superannuation benefits, monthly income, saving schemes, loan coupled schemes, and so on. Investment avenues that are more people oriented are referred to as personal investment.

Life Insurance

Life Insurance is a contract for payment of sum of money to the person assured (or failing him/her, to the person entitled to received the same) on the happening of the event insured against. Usually the contract provides for the payment of an amount of the date of maturity or at specified dates at periodic intervals or at unfortunate death, if it occurs earlier. Among other things, the contract also provides for the payment of an amount of premium periodically to the Corporation by the assured. Life insurance is universally acknowledged to be an institution which eliminates 'risk' substituting certainty for uncertainty and comes to the timely aid of the family in the unfortunate event of the death of the breadwinner. By and large, life insurance is civilisation's partial solution to the problems caused by death.

Life Insurance, in short is concerned with two hazards that stand across the life path of every person: that of dying prematurely leaving a dependent family to fend for itself and that of living to old age without visible means of support. A provision to cover both these hazards is needed. Life policies provides secured income to fend against these hazards.

Features Of Life Policies

1. **Protection:** Savings through life insurance guarantee full protection agains risk of death of the saver. In life insurance, on death, the full sum assured is payable (with bonuses wherever applicable) whereas in other saving schemes, only the amount saved (with interest) is payable.

2. **Aid to thrift:** Life insurance encourages 'thrift'. Long term saving can be made in a reactively 'painless' manner because of the 'easy instalment' facility (method of paying premium either monthly, quarterly, half yearly or yearly) built into the scheme. For example, in Salary Saving Scheme provides convenient method of paying premium each month by deduction from one's salary. The deducted premium is remitted by the Employer to the LIC. The Salary Savings Scheme can be introduced in an institution or establishment subject to specified terms and conditions.

3. **Liquidity:** Indirect form of liquidity is available. Loans can be raised on the sole security of a policy which has acquired loan value, Besides, a life insurance policy is generally accepted as security for a commercial loan. Through surrender of policy, liquidity can be obtained. Now money-back policies are available which provide for periodic repayments enhancing liquidity.

4. **Tax Relief:** Tax relief in Income Tax and Wealth Tax is available for amounts paid by way of premium of life insurance subject to Income Tax rates in force. Assess can avail themselves of provisions in the law for tax relief. In such cases the assured in effect pays a lower premium for his insurance than he would have to pay otherwise.

5. **Money When You Need It:** A suitable insurance plan or combination of different plans can be taken out to meet specific needs that are likely to arise in future. such a children's education. start-in-life or marriage provision or even periodical needs for cash over a stretch of time. Alternatively. policy moneys can be so arranged to be made available at the time of one's retirement from service to be used for any specific purpose. such as for the purchase of a house or for other investments. Subject to certain conditions. loans are granted to policyholders for house building or for purchase of flats.

LIC'S VARIOUS PLANS

In India, Life polices are issued solely by Life Insurance Corporation of India (LIC). It is engaged 100% in life assurance business.

i. Medical and Non Medical Schemes:

Life insurance is normally offered after a medical examination of the life to be assured. However. to facilitate greater spread of insurance and also as a measure of relaxation. LIC has been extending insurance cover without medical examination subject to certain conditions.

ii. With Profit and Without Profit Plans:

An insurance policy can be with or without profit. In the former. bonuses, disclosed, if any after periodical valuations are allotted to the policy and are payable along with the contracted amount. In the 'without' profit plan the contracted amount is paid without any addition.

iii. **Whole-Life and endowment Plans:**

a. Whole Life Assurance Plan is a low cost insurance plan where sum assured is payable on death of the life assured and premiums are payable throughout life.

b. Under Endowment Assurance Plan the sum assured the payable on the date of maturity or on death of the Life Assured, if earlier.

iv. **Term Assurance Plans:**

a. **Two year Temporary Assurance Plan:** Term Assurance for Two years is available under this plan. Sum Assured is payable only on death of the life assured during the term.

b. **Convertible term Assurance Plan:** It provides Term Assurance for 5 to 7 years with an option to purchase a new Limited Payment whole Life Policy or Endowment Assurance Policy at the end of the selected term provided the policy is in full force.

c. **Bima Sandesh:** This is basically a Term Assurance plan with the provision for return of premiums paid on surviving the Term.

d. **Bima Kiran:** This plan is an improved version of Bima Sandesh with an added attraction Loyalty addition, in built accident cover the Free Term Cover after maturity, provided the policy is then in full force.

Plans for Children:

Various Children's Deferred Assurance plans are available viz. CDA. 'AP Jeevan Balya. New CDA and Jeevan Krishore. Jeevan Sukanya is a plan pecially desgned for girls. Money Back Children's Assurance plan is specially esigned to provide for children's higher educational expenses with added ttractions of Guaranteed additions. Loyalty Additions and optional family enefit.

i. **Pension Plans:**

These plans provide for either immediate or deferred pension for life. 'he pension payments are made till the death of the annuitant (unless the policy ıas provision of Guarantee period). Both the Deferred Annuity and Immediate Annuity plans are available with return of GIVE amount on death after vesting nder Jeevan Dharaplan and return of purchase price on death under jeevan .kshay ploan.

i. **Jeevan Sarita** is a joint life last Survival Annuity Cum Assistance Plan where claim amount is payable partly in lumpsum and partly in the form an annuity with return of balance sum assured on the death of survivor.

iii. **Special Plans to meet special needs:**

a. Jeeva Griha Plan (Double cover & triple cover) For people desirous of obtaining a housing loan with the policy acting as collateral security and to ensure repayment of loan in the event of premature death of the borrower.

b. Mortgage Redemption Suitable for borrowers as it ensures that the outstanding is automatically repaid in the event of the borrower's death.

c. Bhavishya Jeevan Ideal plan for professionals with a limited span of high income.

d. New Jana Raksha Ideal for people with no regular income. It provides for death cover for a period of 3 years from first unpaid premium, provided at least for 2 full years premiums have been paid.

e. Double Endowment Ideal for people with physical disability who are otherwise not acceptable for other pans of assurance at normal rates.

f. Fixed Term (Marriage) Endowment / Educational Annuity

   A plan suitable for making provision for start-in-life. like marriage or education of children.

g. Concertible Whole Life: The policy is issued as a whole life plan with an option to convert it into an Endowment Assurance at the end of 5 years. A plan suitable for those who cannot afford with premium in the initial years but have prospects of increased income within few years later.

h. Money Back Plan besides providing life cover during the term of the policy, the Maturity Benefits are paid in instalments by way of survival benefits.

i. Jeevan Surabhi Improved version of Money Back Plan where premiums are payable for a limited period with an added attraction of periodical increase in insurance cover.

Join Life Policies These cover the risk on two lives. Joint Life Endowment is available for husband & Wife or partners in business and 'Jeevan Sathi' for husband & wife only.

k. Jeevan Ghaya The plan ideal to provide for children's higher education.

l. Jeevan Mitra Basically an Endowment Assurance plan with payment of an additional Sum Assured on death of the Life Assured during the term of the policy.

m. Jeevan Shree: Jeevan Shree is basically a limited payment Endowment Assurance Plan with attractive Guaranteed Addition and Loyalty Additions.

ix. Salient Features of Group Schemes:

The Life Insurance Corporation offers life insurance protection and retirement benefits under Group Schemes which are in the nature of employee benefit schemes. These Schemes form ideal schemes provide life means of achieving a better employee morale which will lead to greater productivity. The schemes provide life insurance protection at a very low cost because of the economics achieved through mass administration methods.

The main features of the schemes are low premium, simple insurability conditions such as employee not being absent from duty on grounds of health on the date of entry and easy administration by way of issue of a single master policy covering all the employees.

Post Office Schemes

Post Office Schemes are generally like the commercial bank schemes. They have a savings account, a recurring account, a ten-year cumulative time Deposit account which are also recurring in nature. The savings account

operate in the same way as commercial banks through cheques and there is no restriction on withdrawals

i. Recurring Deposits

Recurring Deposits are in the form of cumulative deposit schemes covering a period of 10 years. 15 years and 20 years. These schemes range from a minimum of Rs.10 monthly installment contribution to Rs.500 monthly contribution. These schemes can even be stopped if the investor thinks that he cannot pay money after a certain period. Generally these schemes are operative from Rs.10 to Rs.100 instalment per month.

ii. Post Office Time Deposits:

The time deposits can be purchased for a minimum of Rs.50. There is no maximum limit. 2, 3 and 5 year post office deposit schemes can be encashed after one – year at a discount. Interest is paid annually. On a one year account interest is paid at 7%, a two year account fetches 7.5% interest and three-year and five-year accounts give 8% and 10% respectively.

iii. National Savings Scheme:

This is a tax saving device in the sense that the amounts deposited under it are exempt to the tune of 20% under sec. 88 of the Income Tax Act that carries 11% p.a rate of interest and a person can make maximum of 12 deposits in a year in multiples of 100 subject to a maximum of Rs.40.000 in a year. Under this scheme, no withdrawal is permitted in first 3 years. Thereafter, the depositor can withdraw once in year and the amount shall not exceed the balance at the end of the 4th preceding financial year. Another attractive feature

in this scheme is that the amount payable to nominee or legal heirs to totall tax-free.

iv. 10 Years Social Security Certificates:

These certificates can be purchased by persons in the age group of 18-45 years. The minimum investment amount is Rs.500. The maturity period of these instruments is 10 years and the rate of interest is 11.3% p.a. compounded annually. The interest qualified for deduction upto a maximum of Rs.10,000 under Section 80-L of the Income Tax Act. These certificates can be encashed pre-mature after 3 years of the date of issue. In case of the death of the certificate holder before expiry of 2 years from the date of issue due to non-natural causes excepting suicide), the legal heir / nominee is entitled to receive and amount equal to 3 tir the face value of the certificates.

v. Indra Vikas Patras:

IVPs are available at post offices and can be purchased by any person. Minimum investment in Indira Vikas Patras is Rs.100 and there is no maximum limit. These are available in the maturity denemintions of Rs.200. 500. 1000 and Rs.5000 and the investor has to pay half the face value. The initial amount is doubled in 512 years and these cannot be encashed prematurе. These instruments are like bearer bonds and hence have to be carefully preserved. These certificates are freely transferable.

vi. National Savings Certificates (VIII Issue)

Such certificates are available in denominations of Rs.100. 500. 1000. 5000 and Rs.10.000. These carry 12% p.a. interest which is compounded half-

yearly. The term of deposit is 6 years and premature encashment is not generally possible. The amount invested in this scheme qualifies for tax rebate of 20% upto a maximum, of Rs.50,000. The National Savings Certificates can be purchased from the post office can be pledged as security for loan and provide nomination facility. The interest accuring annually is deemed to be reinvested and hence will also qualify for tax rebate under section 88 of the income tax Act. Such interest will be entitled to exemption under Sec.80L of the Act.

vii. Deposit Scheme for Retiring Govt. Employees 1989:

The deposit scheme is meant for retiring government employees, subject to a minimum investment of Rs.1,000 and in multiples there of the maximum amount to be invested would not to exceed the total retirement benefit.

Interest payable on the scheme is 10% p.a. half yearly i.e. on 30th June and 31st December. Under the Scheme Interest earned is completely tax free. Only one account can be opened by retired Central / State Govt. employee in own name or jointly with the spouse. The account can be opened within three months from the date of receiving the retirement benefits.

The scheme will be operated through branches of SBI and its subsidiaries and selected branches of Nationalised Banks at Dist. Hqrs. Entire balance or part thereof can be withdrawn after the expiry of three years from the date of deposit. Only one withdrawal in multiples of Rs.1000/- can be made in respect of deposit in a calendar year. Premature encashment can be made after one year from the date of deposit but before the expiry of 3 years, in which case the interest on the amount so withdrawn will be payable at 4% from the date of

deposit upto the date of withdrawal. The excess interest paid at 10% if any, will be adjusted at the time of such withdrawal.

viii. Deposit Scheme for Retiring Employees of Public Sector Companies 1991:

This deposit scheme is meant for retiring employees of public sector companies subject to minimum deposit of Rs.1000 and maximum not exceeding the total retirement benefits. Interest payable on such deposit is 10% p.a. payable, half yearly, on 30th June and 31st December. The features of the scheme including tax rebate are similar to the scheme meant for retiring government employees discussed above.

ix. Public Provident Fund Scheme (PPF Scheme)

One of the attractive schemes, benefits the HUF and the individuals (sefl-employed) who do not have the facility to same through PF contributions. Even salaried employees are permitted to contribute to this scheme besides contributions made to their P.F. in their respective establishments. The subscriber to PPF account is required to make a minimum deposit of Rs.100 per year subject to maximum limit of Rs.60,000 per year. PPF deposits earn a compound interest rate of 12% p.a. which is completely exempt from taxes. Deposits are fully exempt from wealth tax. Withdrawals are permitted every year from 5th financial year. Loan facility is available, from the 3rd Financial year. Deposits in P.P.F are not subject to any attachment under any order or decree of the court. The deposits in P.P.F are qualified for tax rebate under section 88 of the Income tax Act.

x. **Post Office Monthly Income Scheme:**

Under the Scheme deposits are permitted subject to a minimum of Rs.6000 and maximum of Rs.2.04 lakhs in single account and Rs.4.08 lakhs in joint account. Such schemes carry 13% interest p.a. payable monthly i.e. Rs.130/- will be paid every month on a deposit of Rs.12,000. Besides bonus of 10% is also payable on maturity. i.e. Rs. 1200/- will be paid as bonus after 6 years for deposit of Rs.12,000. The maturity period is 6 years. Interest is exempt under Sec. 80 L of the Income Tax Act.

Bank Deposits:

Deposits with commercial banks are the most popular form of investment. To suit the requirements of depositors various deposit schemes are introduced by banks. Deposits in scheduled banks are very safe because of the regulation of the RBI and the guarantee provided by the Deposit Insurance Corporation. Bank deposits are very popular because they enjoy exceptionally high liquidity. Now RBI has fixed interest rate on deposits, prescribing only by the ceiling rate for different maturities.

Fixed Deposits with Companies:

Acceptance of deposits from the public is an important mode of financing the corporate sector. Companies prefer to raise finance by accepting deposits from the public rather than taking loans from financial institutions because: the interest payable on deposits is lower than the interest usually payable on loans from banks and financial institutions. Deposits from public are unsecured debts and therefore the company need not provide any security by way of mortgage, hypothecation, etc. of its assets. It is a simpler mode of

financing and it can bring considerable sum of money from thousand of people irrespective of whether they are shareholders or debenture holders of the company. Though the amount thus collected can be huge but state of individual deposit holders will be generally low.

A vast majority of the non-banking companies are, however, those engaged in manufacturing, trading, shipping, hotel business, mining, transportation, etc., which fall in the category of 'non-financial companies'. In order to more effectively regulate the deposits-accepting activities of these companies, Companies Act was amended in 1974. The Companies (Amendment) Act of 1974 inserted a new section 58 A which came into effect from 1st February 1975, for regulating the acceptance of deposits by non-banking non-financial companies. Section 58A of the Act under Sub-section (1) confers powers to the Central Government to prescribe in consultation with the Reserve Bank of India, the limits upto which, the manner in which and conditions subject to which the deposits from public can be invited or accepted by non-banking non-financial companies. Thus the function of regulating acceptance of deposits from public by companies engaged in manufacturing, mining, trading, etc, activities, which have been classified as non-banking non-activities, which have been classified as non-banking non-financial companies now vests with the Central Government (Department of Company affairs) instead of with the Reserve Bank of India.

With a view to further safe guarding the interests of the deposits, another section 58B has also been simultaneously inserted in the companies Act. This section makes the regulatory provisions contained in the Companies Act relating to issue of prospectus of companies, applicable to advertisements

ch may be issued for inviting deposits. Recently the RBI had come with stiff provisions against NBFCs.

MUTUAL FUNDS

A mutual fund is a collective pool of fund mobilised from a number of investors and deployed n a portfolio of various securities. so as to provide a steady income and / or capital growth. Mutual Fund is a fund created by contributions from members for the purpose of collective investment and mutual sharing among members of the income and gains from activities of the fund. The basic appeal, "if you are afraid of risk, buy MUTUAL FUND Units". has persuaded millions of people. the word over the buy mutual fund units. instead of going for bank deposits. shares. bonds. etc. The fundamental driving force of the mutual fund is "safety of principal. stability of income and risk minimisation".

The concept of Mutual Fund first emanated in the Great Britain in the 1840's where the merchants pooled their resources for trading in large volume with the British Colonies in order to spread their business, risks and returns. It however. caught the fancy of the investing public much later in the 80s when the industry saw tremendous growth in the USA. the UK and this trend soon spread to other European countries. The first true open ended mutual fund in the United States. the Massachussettes Investors' Trust was established in 192. By the 1930's however. a good number of close ended mutual funds had been formed in the USA. Over the years. mutual funds have become very popular not only in the states but also in many countries in operation in the UK. 2500 in the USA with ¼ of the US households investing in those funds.

In India, mutual fund came into being through the Unit Trust of India. UTI Came into existence in 1964 and pioneered the concept of 'units' in India. However, the first mutual fund scheme in the real sense of the term had to wait until 1986 when UTI introduced the Master Share. The response from the investors was splendid and its success heralded the birth of other mutual funds. Now mutual funds are operated by public sector organisations like the State Bank of India, Indian Bank, LIC, GIC, ICICI and IDBI through their wholly owned subsidiaries and also by private sector operators such as the Alliance Capital, 20th Century finance, the Morgan Stanley, Birla finance, Kothari Mutual fund, Apple Mutual fund, etc.

The latest entrant is the IDBI with a novel feature of 'safety net', whereby the original subscribers are assured of protection of face capital value, in the case of the scheme faltering. There are about 20 operators, providing as many as 250 schemes. 50 schemes are quoted in stock exchanges, 90 schemes are repurchased while the rest are neither traded in stock exchange nor repurchased. Mutual funds are subject to stock market fluctuations, which in turn are caused by several factors.

Objectives:

The objectives of mutual funds are

(i) to provide an investment opportunity for the investors, especially the small income group of people to participate in the growing corporate securities market though not directly, but in an indirect manner

(ii) To provide a return that is more than bank deposit rate, to the subscribers without corresponding rise in the level of risk.

(iii) To mobilise the savings of the public and channel them into productive investments,

(iv) To provide for different investment objectives like current return, capital approximation, tax benefit or a mixture of these and

(v) To strengthen the capital market by adding the mutual fund dimension to the same.

Operations

The mutual fund operation works this way. The mutual fund management designs a scheme with specified goal, viz income, growth tax-off or mixture of these and floats the scheme after meeting the legal formalities thereto. The public are invited to subscribe to the scheme. Baring a handful of schemes all other schemes just require a minimum exposure of Rs.500. at present, per application. So many can participate in mutual fund schemes unlike public issues of shares requiring minimum exposure of Rs.5000. The collected sum is invested, on behalf of the subscribers to the scheme, by there fund managers in corporate, money market and other securities. The capital gains realised by dealing in the securities and interest and dividend earned from the scrips are distributed or reinvested after meeting fund expenditures, subject to the nature of the fund. In an income scheme major portion of earnings is distributed as dividend on the units of the funds, while in the case of growth scheme, the earnings are mostly ploughed back.

Merits Of Mutual Fund:

The following are the advantages of mutual fund schemes :

(i) Safety of principal

(ii) Stable and fair return

(iii) Risk reduction

(iv) Diversified portfolio

(v) Investors are relieved of the botheration of managing investments

(vi) Broad-basing of capital market

(vii) Benefit of professional skill of fund managers

(viii) Capital formation takes effect

(ix) Small and paun sophisticated investors can benefit from mutual fund

(x) Variety of schemes are available to choose form

(xi) Some schemes have excellent liquidity and

(xii) The common investors are relieved of the problems of managing their portfolio themselves.

Problems Of Mutual Funds

Most mutual fund schemes lack liquidity. Liquidity means ability to realise the asset in cash without loss of value and time. By this yardstick, most schemes are illiquid.

Mutual funds are subject to market fluctuation. The problem is in a growing market mutual funds grow less than the market, as it should be. But in a declining market they side down deeper than the market, which should not be the case. It is reported, at any point of time, sellers outnumber buyers in the

case of mutual funds. This is due to upward rigidity in a booming market and downward flexibility of mutual fund values in a bearish market.

Mutual funds lack transparency safety net is not available ie., many schemes quote below par value.

Not all mutual funds are well managed. As the size of corpus rises, it seems value investment takes the back seat. Typical example is the master gain 1992 scheme of UTI which is a world record in terms of collection but as to value one of the poorest performers. Even after 6 years since launching in May 1992, it has not grown beyond 10% Morgan Stanely mutual fund which was launched with lot of fanfare is again quoting below par value. One reason could be the size, while the intended corpus was Rs.300crs, the actual was high at Rs.1000 crs. The rule, in a crowd per capital share falls in found to be operating in mutual funds. Many schemes quote below net assets value for a number of months. (Net assets value is obtained by dividing the market value of assets held, plus accured income, minus outstanding liabilities divided by the number of units outstanding).

Types Of Mutual Funds

Mutual funds are of several types. On the basis of investment portfolio held, mutual funds may be bond funds stock funds, income funds, growth funds, money market funds, leveraged funds, balanced funds, specialised funds, performance funds, multi-purpose funds, real estate funds and specially funds. Bond funds multi-purpose funds, real estate funds and specially funds. Bond funds generally invest in corporate and government bonds.

Safety of principal, stable earnings and lower risk are the features of these funds. Stock funds hold equity shares and convertible bonds as investments. Generally capital appreciation or good dividend is the sought goal. There is risk and hence probability of high return. Income funds hold high dividend payout scrips and high rated bonds as investments. Current income is the goal. Money market funds invest in money market securities such as certificate of deposits, commercial paper, etc. Exclusive MMFs are governed by RBI while the rest are governed by SEBI guidelines. Leveraged funds aim at maximising return to fund holders by indulging in some leveraging. Forward dealings, shot-sales, etc may be resorted to Balanced funds hold equity and debt scrips in a balanced manner.

There are balanced growth and balanced income funds. Also balancing as to industry exposure, sectoral exposure, regional exposure, etc may be attempted. Growth funds are those holding investments in high growth blue-chips. Low current income and high capital appreciation are aimed at. Performance funds hold investments in scrips of unseasoned companies with high P-E ratios and also price volatility. It is a speculative type. Specialised funds keep their funds invested in a small group of concerns or industries. Risk is more due to negligible diversification. Specialty funds invest in good trackrecord companies which offer handsome growth and income opportunity. Multipurpose funds invest in a wide spectrum of diverse nature of scrips so that growth income speculative benefits, leverage benefits, etc can be reaped. Finally, real estate funds come, who invest in real-estate ventures.

On the functional basis mutual funds may be classified into open-ended fund and close-ended fund.

A mutual fund is said to be 'open-ended' if the period of the fund and the target amount of the fund are not defined or specified. The holders of the units in the fund can resell them to the issuing mutual fund company at any time. Open ended mutual funds can sell unlimited number of units and thus keep going lager. The open-ended mutual funds can repurchase their own units. These companies sell new units at NAV plus a loading or management fee. UTI'S unit schemes 1964 and 1965, Canbank Mutual Fund's canganga, Kothri Pioneer Prima, JM liquid growth and JM Liquid dividend, Apple platinum, Alliance'95 etc are open ended funds. The minimum corpus for an open ended mutual fund is Rs.50 crores as per SEBI guidelines. There are about 25 open-ended schemes in operation. A mutual fund is said to be close-ended if the period of the fund and target amount of the fund are definite and specified. It's size in terms of number of units is fixed. Its units are issued like any company's new issues, listed and quoted at stock exchange. The minimum corpus for a close-ended fund is Rs.20 crores. Canbonus, ICICI premier, Ind Navratna, Mastershare, Magnum, Centurion Prudence, GIC Rise, etc are examples of close-ended funds There are about 170 close-ended funds in the country.

On the geographical basis, mutual funds may be domestic or off-shore funds, Most mutual funds are domestic, mobilising funds from domestic citizens, Off –shore mutual funds mobilise resources form foreign lands. Foreign currency is obtained. UTI India Fund is the first off-shore fund floated in 1986 which was a great success. Later India Growth Fund, Canbank's Indo-swiss Himalayan fund, Commonwealth Equity fund, etc were floated.

Finally on the basis of tax benefit, funds may be classified as tax-benefit funds or otherwise. As per provisions of the Income Tax Act 1961,

investments in tax off funds upto Rs.10000 is eligible fcr tax rebate undei section 88 of the act. Master equity plan of UTI, Personal equity plan of PNB and Canara bank, Magmum tax profit schemes of SBI Shriram tax guardian etc, are tax-benefit schemes. These schemes are afloat generally during Jan-Mar every year.

INSTITUTIONAL INVESTMENTS

Institutional investments refer to investments that are generally preferred to by institutional investors like mutual funds, pension funds, provident funds, like funds, and so on. Actually institutional investors are financial intermediaries of all sorts. They are distinct from individual investors. Actually personal investments held by individuals are routed into institutional investor's portfolios.

In India the UTI, the LIC, the GIC, the mutual funds, the NBFCs, and the like can be considered as institutional investors. The source of investable funds, to them accrue largely from individual investors and to a small extent from corporate and other investors. Institutional investors prefer to park their funds in safe outlets, though now a change in their portfolio complexion had resulted.

Traditional institutional investments

Traditional institutional investments constitute the government bounds, govt. dated securities, municipal bonds, mortgage securities and the like where security is 100%abd risk is 0%. Return is eventually lower or lowest. LIC and GIC investments made, until recently, mostly, upto 75% of investable funds, in Govt. approved securities only. Now it is moderated to around 50% or so. As

far as UTI is concerned, it predominantly held corporate debentures and sure dividend paying corporate scrips in its portfolio.

Present day institutional investments

Present day institutional investors have come out of their cautious tread and seek risk investments, both domestic and overseas. The foreign institutional investors are dominating Indian bourses since 1995. What a drastic change in their Outlook. But our home grown institutional investors are still conservative a bit. Yet they have moved far from their traditional kitty of investments.

Venture capital is one such new investment outlet that institutional investors go for, whereby equity investments are made in hi-tech, R&D strong and novelty enterprises. Once the enterprise establishes itself, the venture fund might disinvest and book capital appreciation. This is an illiquid investment outlet and hence only cashrich players can think of this.

Commercial loans for car purchase and housing activities are yet another new investment outlets. LIC Housing Finance Ltd., Ind Bank Housing Finance Ltd, Apple Car-Finance, etc are a few of very many operators in this area. Choice of borrowers, ability to reach the borrowers, legal aspects, etc must be considered well.

Leveraged buyouts are another newfound investment operations. Under leveraged buyouts, institutional investors acquire existing companies using lot of debt and small equity funds. After that the concern is downsized and restructured paselling non-core divisions. With the realisations debts are repaid. In the process equity investment made gain appreciation. Later, the

institutional investor may sell out even the core-business retained. This is a hi-tech financial re-engineering requiring great calibre.

Real estate investments are also effected by institutional investors. They must enter this arena in a more conscpicious way. There is lot of money in this investment alternative. Extensive analysis of property equity is needed.

PSEUDO-INVESTMENTS

Pseudo investments resemble investments in the sense risk and return are involved. There are different types. Speculation, Gambling and Hedging and the types involved. A brief account of each is provided below.

Speculation

Speculation involves entering into futures contracts (contracts where is effected on a future date, at price decided now at the time of entering into the contract), whereby one party agrees to buy (sell) and the other party agrees to sell (buy), a specified quantity of a specified asset (share, commodity, etc) at the today agreed upon price.

The person who sells now expects the price of the underlying asset to come down by the time the futures contract is due for settlement. He is called the 'bear' speculator. If his calculations go right, the other party's calculations go wrong. The other party is asked to give the difference in prices and wind-up the contract. There is no physical delivery, but only settlement of price difference. Let us assume A agrees to sell 100 shares of X Ltd to B who agrees to buy the same, at a price of Rs.120 per shares, contract to be performed two

months from now. As we have above portrayed say, by 2 months hence, the price falls to Rs.110 per share. B will give out Rs.100 (120-10) = Rs. 1000 to A and the contract is over, or the contract is revived with price reckoned at Rs.110.

In this case, A agrees to buy. His expectation is that price will go up. He is called a "bull" speculator. If he is proved right and price per share goes to Rs.140, then B will give out the difference in price to A. That is, B will pay a Rs.100 (140-120) = Rs.2000. The contract is revived at the new price, viz., Rs.140.

These futures contracts have to be executed through organised exchanges only. What is referred to above is stock futures. There are currency futures, interest rate futures, commodity futures, etc.

Gambling

Gambling is wagering. Wagering refers to a game of chance. Gambling is a very short period investment and the results of the so-called. Investment are known by the roll of the dice or the turn of a card or the performance of a sports team or the pace of the racing horse and so on. There are certain strategies betting known as speed betting and odds betting. The former is used in sports games and latter is used for betting on elections, horses, etc.

Gambling and Investing

Gambling and investing are similar. Initial outlay is involved in both. The payoffs of both depend on outcomes that are unpredictable

and hence random. Both need strategies to minimise risk and maximusc return. The strategies can be technical (if these are based on past performance of stocks / horses / teams) or fundamental (if the strategies are based on company analysis / horse's features and training or team's composition, training and spirit).

❖ Spread Betting

Say two teams, A and B, are taking a sports event, say a Volleyball match. The book-maker, ie., the dealer in the betting, say creates a spread, by deciding that Team A is favoured by 5 points. This means, team A will be reckoned successful only if its final score minus 5 > the score of team B. If the spread is higher, smaller amount will be bet on team A and more amount will pabe bet on team B and vice versa, other things being equal. At some value of the spread, more or less equal amount will be bet on both teams and that the book-maker is protected. This is the specialty of spread strategies.

The bookmakers earning is the excess of what he receives from the bettors and what he pays to the winner. If the bettor puts up Rs.110 for a Rs.100 bet the book-maker receives Rs.110 from each better. If the book is balanced, there will be equal number of bets on either team. Assume there are 10 bets on each team. To the winner, the sum paid by him viz. Rs.110 and Rs.100 are paid. The loser forgoes Rs.110 paid by him. So. from 10+10 bets received on both teams a sum of Rs.2200 ie., (20x110) is received by the book-maker. Against this he pays back only Rs.2100 (ie., Rs.110x10, being money paid by the 10 winners in advance now returned plus Rs.100x10, being bet money won by them). As the 10

losers did not get anything back. the book-maker gains Rs.100. ie.,Rs.2200 –Rs.2100. A book-maker must ensure that after the game, he pays less than what he has received. The gain of the book-maker is loss of the bettors put together.

Odds Betting

It is used in horse race. Race horses are not of equal favourites to contenders. So, the book-maker must ensure he gets bets on all horses. How by asking relatively more money on the most favourite and offering more on the other horse, the book-maker can spread the betting over all the contesting horses and over the contenders.

Say, there are 6 horses in the race and say, the speed queen in the favourite. The others are, among themselves, equal. Say the odds on these 6 horses are set at 4 to 1. That is if any of these horses wins, the bettor will get Rs.5 (ie.,Rs.4+Re.1) for every rupee placed on bet. The odds on the one favourite speed queen will have to be set such that a 20% margin out of total collection is kept as 'take' money and only the balance is paid out. The 'take' money is for administrative expenses and to provide for profit to the organisers. Let us take the total pool is Rs 2000 and that 20% of this viz Rs.400 will be the 'take' whichever horse wins, only Rs.1600 will be paid. If any of the less favourite horses with odds at 4 to 1 wins, Rs.1600 will be paid out. Then a sum of 1/5 of the Rs.1600 or Rs.320 has to be bet money on the less favourite horses. The total money collected from the 5 horses is Rs.320x5=Rs.1600 so the bet money on the favourite speed queen has to be Rs.400, so that total pool will be Rs.2000. Then the odds on the speed queen is set like

this(Total pool-Take-bet on the speed queen to bet on the speed queen so the odds come to (Rs.200-400 400) /400 or 1200/400 or 3 to 1. If speed queen wins, Rs.400+Rs.1200=Rs.1600 will be paid which is equal to the pool take if any other horse wins Rs.320+Rs.4(320)=Rs.320+1280=Rs.1600 will be paid which is equal to 'pool' – 'take'.

HEDGING

Hedging refers to protection or cover against risk. When price is unpredictable, buying (ie., technically referred to as taking a long position) and selling (technically known as short position), may lead to risk. Say, you have bought 100 shares of XLtd at Rs.115 per share. If price falls, you lose. If you have agreed to sell 100 shares of Y Ltd at Rs.80 per share and later price rises to Rs.90 per share and you lose. To guard against such risk of loss, hedging is done. In foreign exchange transactions risks are involved because foreign exchange rates fluctuate. You know the South East Asian Currency Crisis of 1997 and Mexican Currency Crisis of 1994-95. Through hedging risk can be reduced, if not eliminated.

Hedging involves entering into two contracts of the same size but opposite nature in the same asset simultaneously Hedging is defined as, "arranging for two different opposite positions such that the potential losses from one of the positions is almost offset by profits from the other position". J.C. Francis in Management of Investments, McGraw Hill.

A agrees to sell to B. 1000 shares of Excel Ltd @ Rs.55 per share two months from now. If price increases later, A is a loser as he has to buy the

shares for delivery to B at a higher price. To guard against this potential risk, let A enter into long position of same maturity, same size and same asset. Then whichever way future price goes, loss in one is made good by gain in the other. This is a perfect hedge.

Suppose you import $5,000,000 worth of machinery from the USA, payment due 3 months later. Now the Re/$ exchange rate is say Rs.48. If you think rupee will depreciate to Rs.49 in 3 months' time, to get $5000,000, you have to pay extra Rs.5000,000, as against the current exchange rate scenario. To protect against this risk, one can buy dollars in the forward market, at today's rate, delivery 3 months later. You can enter into a futures long position contract, whereby $5000,000 will be delivered to you at currently agreed upon forex rate. You can enter to call option (refer next lesson), if you want. All these are all risk hedging mechanisms.

Comparisons of Investment, Speculation, Gambling and Hedging

Let us compare investment, speculation. gambling and hedging on selected parameters.

No	Parameter	Investment	Speculation	Gambling	Hedging
1	Time Horizon	Months to years	Days to weeks	Few hours to a day	Weeks to months
2	Goal Orientation	Periodic and capital gain	One-time quick profit	One-time quick windfall	Cover against price variation
3	Risk Involved	Low to moderate	Moderate to high	High to higher	Low to minimum
4	Instruments	A wide variety, shares, bonds, Govt. scrips, bullion, etc.	Options and futures	Bettings, care game, dice game, etc.	Forwards, options, futures, etc.
5	Tax Concessions	Available	Not available	Not available	Not applicable
6	Liquidity	Varies widely	Exists	No	A little
7	Tools of Analysis	Technical & fundamental	Technical	Technical and fundamental	Technical
8	Source of Income	Economic Operations	Market fluctuation	Betting ability and bit of luck	Market fluctuation
9	Managerial Rights	Equity Investments give	No	As club members eligible	No
10	Return of capital	Medium to high probability	No commitment	50 :50	No commitment
11	Transferability	Yes, possible	Not applicable	Not applicable	Not applicable
12	Pledgeability	-do-	-do-	-do-	-do-
13	Risk over	Diversification	Spread Strategies	Luck and knowledge	Cover generators
14	Availability	Wide in all nations	More developed nations	Restricted availability	Fairly available
15	Type of Market	Primary and Secondary	Secondary only	Primary only	Mostly Secondary

CONCEPT OF PORTFOLIO MANAGEMENT

The concept of Portfolio Management was developed by Harry M.Markowitz, with the publication of a landmark paper, 'Portfolio Selection', in March 1952, in the Journal of Finance. Later William F.Sharpe joined in the development of modern Portfolio Theory. In recognition of their contribution, 1990 Nobel Prize for Economics was awarded to Markowitz, Sharpe and Miller. So, the topic Portfolio Management is a Nobel prize winning topic.

First we need to know, what a portfolio is Portfolio is a collection, assemblage or combination of things. In the context of investment management, portfolio means a collection of securities / investments. In investment management a desirable course is to have a portfolio of investment. That is, investment in plural number of securities is desirable as against investment in any single security. Why? Suppose you have invested all your savings in just one company's share. It is a good company and you are sure of reasonable returns – dividend and capital gain. Now you have no cause to worry. Yet, what will happen tomorrow? If anything goes wrong with the company's fortunes, you may suffer greatly for the returns from your investment will be fluctuating. You run the risk of uncertain return or small return or both. This is as if you keep all eggs in one basket. If the basket falls, you lose heavily as all eggs are damaged. Similar is the case with investment in just one share / debenture / mutual fund / company / bank / industry. You should go for diversified investments in several shares / debentures / mutual funds / companies / industries / regions or like that. What do you gain from such diversified investment or portfolio? Your returns are more or less stable, may be little less in scale. Still, you are sure of what will be your returns. How does a portfolio guarantee stable return ? Because, not all the securities will

uniformly become dull or booming at any point of time. A few may fare well, some may move bad and the rest may continue to be performing statisfactorily. On the whole, there is a guarantee of more or less stable returns, because extraordinarily bad performance of some securities is off-set by the better performance of some other securities in the portfolio. So, an 'averaging' takes place, resulting in no violent fluctuations in returns. That is how a portfolio generates a stable return. A portfolio is like putting your eggs in several markets. How, you realise, what is a portfolio of investment, its significance and how it works.

An example of hypothetical expected returns of two individual securities, say A and B and that of a 50:50 portfolio consisting of these portfolios are considered here. The returns of these securities vary with level of rainfall. A's return increases with rain while that of B increases with shine. The details of hypothetical returns are given below.

Returns on individual securities and a portfolio of the securities

State of Nature	Return from 'A'	Return from 'B'	Return from 50:50 Portfolio of A & B
Very heavy rain	25%	5%	15%
Heavy rain	20%	10%	15%
Moderate rain	15%	15%	15%
Draught	10%	20%	15%
Severe drought	5%	25%	15%

The returns are expected returns and not actual returns. And the returns vary with conditions of whether. And weather conditions are not predicted of sure. Hence the uncertainty over state of nature. So, if one puts all money in "A", she may gain if it rains heavily. But she may lose if it shines hot. Reverse is the case with "B". If one goes for a combination of A & B, there is no fluctuation in return. Whether in rains or shines, the return is 15%. But this is not the peak return. At the same time it is not the trough as well. So, a moderate, an average amount of return is certain with a portfolio of investment. But this is better than return from 'A' if there is drought and return from 'B' if there is heavy rain.

Let us turn to the concept of portfolio management. We mentioned that a portfolio ensures stable return. Yes, it is. Is that return reasonable? Is it not possible to increase return, without getting into the problem fluctuating return? Is it not possible to design a portfolio with lesser fluctuation, but with no decline in return? In other words, whether the portfolio is efficient or optimal? How such an efficient portfolio be identified from a set of portfolio? Will an efficient portfolio continue to remain so for all times? If not, how to revise a portfolio? All these are some searching questions. Portfolio management is concerned with all these. Portfolio management therefore means the planning, execution and control of activities concerning constructing an attainable sets of portfolios, identifying the efficient portfolios, choosing a portfolio and if need be, revision of portfolio.

NEED FOR PORTFOLIO MANAGEMENT

The world of investment is full of risk. Portfolio management enables risk diversification and hence return for unit risk can be maximised through efficient portfolio construction, selection and revision.

Every investor wants maximum return at minimum risk. As to return there prevails non-station and as to risk there prevails aversion. Though risk and return move in the same direction, the scale of return per unit of risk can be maximised through careful allocation of funds across different investment avenues. And such careful allocation is nothing but portfolio management.

Risk is minimise through diversification. But all diversification may not help reducing risk. So, there is an optimal level for diversification. It is achieved through efficient portfolio management. Hence the need for portfolio management.

INPUTS FOR PORTFOLIO CONSTRUCTION

Portfolio is a composition of investments with the purpose of maximising return and minimising risk. What individual investments would constitute the composition depends, in the first place, on the goals of the portfolio. One the goal of the portfolio is return maximisation. To achieve this, a choice of individual investment securities for inclusion in the portfolio is made. And, the return and risk of such individual investment securities are relevant inputs for portfolio construction. Thus, portfolio goal and return and risk of individual securities included in the portfolio are the inputs for portfolio construction. Further discussion on these follows.

Portfolio Goals

The portfolio goals of investors differ. They are:

Maximum tax savings

Low, but unfluctuating return.

Higher capital appreciation.

A sectoral portfolio

So, portfolio goals are the first and foremost input to initiate portfolio construction process. Current return, capital gain, tax benefit, liquidity, risk reduction, opportunity for participation in future capital expansion on a preferential basis, buy-back guarantee etc., are certain portfolio goals.

Return And Risk Of Individual Securities

Portfolio management needs data as to return and risk of individual securities that the portfolio consists of. Because, portfolio return and portfolio risk (essential variables in portfolio management are derived from returns and risk of individual securities.

Return means income or gain. Current income, capital gain, tax shield, right to subscribe to future issues, preferential allotment in future issues, etc. are all returns. The tax shield, rights and preferential allotment, etc. generally get reflected in the price of the security and that capital gain is inclusive of all these. So, current income and capital gain are the principal types of returns of a security.

In the case of shares, debentures, bonds, etc. which are referred to financial asset / investments, the future returns, their size and variability, are

important factors influencing investment decisions. Measurement of return is an important task. The following table gives some common measures of return for individual equity and debt securities.

Return on Different Types of Securities

Security	Current yield or Estimated yield	Actual yield or realised yield
1. Debenture / bonds	Expected interest / Current price of Debenture or bond	Interest received / Actual price of purchase
2. Shares or stocks		Dividend received / Actual purchase price.

There is another more versatile, measure of return, known as 'holding period yield' (HPY). This measure is useful for all classes of assets / investment securities. The formula is:

$$HPY = \frac{\text{Income received during year or period t} + \text{Change in price during year or period t}}{\text{Price at the beginning of year or period t}}$$

Let us compute the return for some securities now. An investor buys a 17% bond of Rs.1000 face value, with 10year maturity, at Rs.850. Calculate current yield and yield to maturity.

Current yield = expected coupon interest / current market price * 100

$$= \frac{170 \text{ or } 17\% \text{ on } 1000}{850} * 100 = 20\%$$

$$\text{Yield to maturity} = \frac{\text{average annual return}}{\text{average investment}}$$

average annual return = expected annual interest on the Bond + (maturity value - current value) / period to maturity

$$= 170 + \frac{1000-850}{10} = 185$$

Average investment = (current price + maturity value)/2

= (850 +1000)/2 = 925

$$\text{Now, yield to Maturity (YTM)} = \frac{\text{Annual average return}}{\text{Average investment}} = \frac{185}{925}$$

= 0.2 or 20%

In the case of redeemable securities the YTM is generally calculated. The above formula can be applied to calculate the return on redeemable preference shares also. For non-redeemable securities – like equity shares.

irredeemable debentures and preference shares YTM cannot be calculated. There the Holding Period Yield (HPY) is appropriate.

An investor has bought an equity share a year ago at Rs.85. He has just received a dividend of Rs.20 on the share and now the ex-dividend price of the share is Rs.105. Calculate actual yield and HPY.

$$\text{Actual dividend yield} = \frac{\text{Dividend received}}{\text{Purchase price}} \times 100$$

$$= \frac{20}{85} \times 100 = 23.53\%$$

$$\text{HPY} = \frac{\text{Dividend received + change in price}}{\text{Price at the beginning}}$$

$$= \frac{20 + (105 - 85)}{85} = \frac{40}{85} = 0.47 = 47\%$$

Expected return based probability distribution

Suppose the return on a security has the following probability distribution:

10% with p = .3: 15% with p = .4 and 20% with p = .3. Then expected return = Summation:

$$R_iP_i = 10\% \times .3 + 15\% \times .4 + 20\% \times .3 = 3\% + 6\% + 6\% = 15\%$$

In the case of equity shares, earnings yield, another measure of return is also used. it is simply, the earnings per share (ie. earnings after interest, tax and preference dividend / outstanding shares) divided by the current price. Say the EPS for a company's share is Rs.4 and its current market price is Rs.36. The earnings yield = 4/36 = .11 =11%. The inverse of earnings yield is popularly known as P/E ratio. It is here 36/4 = 9. P/E ration indicates show how a security's price is related to its earnings. To sell or buy a security is well planned with P/E ratio. A security with a high P/E ration may be sold as it is highly priced now, and at nay time its price might come down. A security with low P/E is relatively underpriced. It is better to put your money in it, as its price might move up shortly and you get a capital gain. Hence, the use of earnings yield and its inverse, the P/E ratio. In any case current price and expected future price must be considered.

Risk is variability or volatility in anything. In investment analysis, risk is the variability in return. Risk simply measures the fluctuations in return. Higher fluctuation means higher risk and vice versa. Individual securities have their own risk levels and portfolios of securities have also risk. Let us first study risk of an individual security.

As risk is the variability in return, any measure of variability can be a measure of risk. In statistics we study range, quartile deviation, mean

deviation, standard deviation, etc., which are measures of variability or dispersion. When we compute these measures with respect to the return of a security, we get the risk of the security. Say the return on security, Y, for the past 10 years are:

12%, 18%, 13%, 22%, 8%, 5%, 40%, 18%, 20% and 24%

Range = Highest value – Lowest value = 40% - 5% = 35%

Quartile deviation = 3^{rd} quartile – 1^{st} quartile M

= 22% - 12% = 10%

$$\text{Mean deviation} = \sum_{i=1}^{n} \frac{/R_i - MR/}{n}$$

where the sign '//' read as modules, which means all values are considered positive irrespective of sign and MR is mean return =18%

$$= \frac{74}{10} = 7.4\%$$

The most appropriate measure of risk of a security is the standard deviation of its returns. The formula is:

$$S.D = S = [\text{Summ } (R_i - MR) / N]^{1/2}$$

We may calculate the same here. MR = Mean = 18%

R	R_i - MR	$(R_i - MR)^2$
12	-6	36
18	0	0
13	-5	25
22	4	16
8	-10	100
5	-13	169
40	22	484
18	0	0
20	2	4
24	6	36
Summation $(R_i - MR)^2$		870

S.D = S = Square root of (80 .0) = 9.32%

The risk of a security consists of two components, viz., systematic risk and un-systematic risk. Systematic risk, otherwise called as nondiversifiable risk, arise due to fluctuations in general economic conditions, in people's preferences political factors, etc. These affect all industries and all securities. Un-systematic risk is specific to a particular firm, security or industry. The fluctuations in the sales, in management skills, in productivity and the like of a particular firm affect the return on the equity of that firm. The return fluctuates, resulting in risk. This risk is called un-systematic or diversifiable risk. We mentioned that, a portfolio reduces risk. When we put our money in diverse securities, the un-systematic risk of the different securities get mutually off-set or adjusted to a great extent, reducing the risk of the portfolio. In other words, the portfolio would still have some of the un-off-set un-systematic risk of the

securities and the full level of systematic risk. A well diversified portfolio completely reduces the non-systematic risk and has only the systematic risk.

Correlation Coefficient of Returns of Pairs of Securities in the Portfolio

Apart risk and return of individual securities, correlation coefficients of pairs of securities in the portfolio are relevant aspect for portfolio decision making.

Consider a pair of securities whose returns are as follows:

Return of

Security 1 : x : 18 20 22 24 26

Return of

Security 2 : y : 36 34 32 30 28

(x-mx); mx = 22: -4 -2 0 2 4

$(x-mx)^2$: 16 4 0 4 16 mx = mean return of x &

(y-my); my = 32: 4 2 0 -2 -4 my = mean return of y.

$(y-my)^2$: 16 4 0 4 16

(x-mx) (y-my) = :-16 –4 0 -4 -16

correiation between returns of securities 1 and 2 is

$$= \frac{(x-mx)\,(y-my)\,/\,(n-1)}{((x-mx)^2\,/\,(n-1)\,(y-my)^2\,/\,(n-1))^{1/2}}$$

= -(40/4) / (Sqr. root of 40/4) Sqr. root of 40/4)

= - 10 / 10 = 1

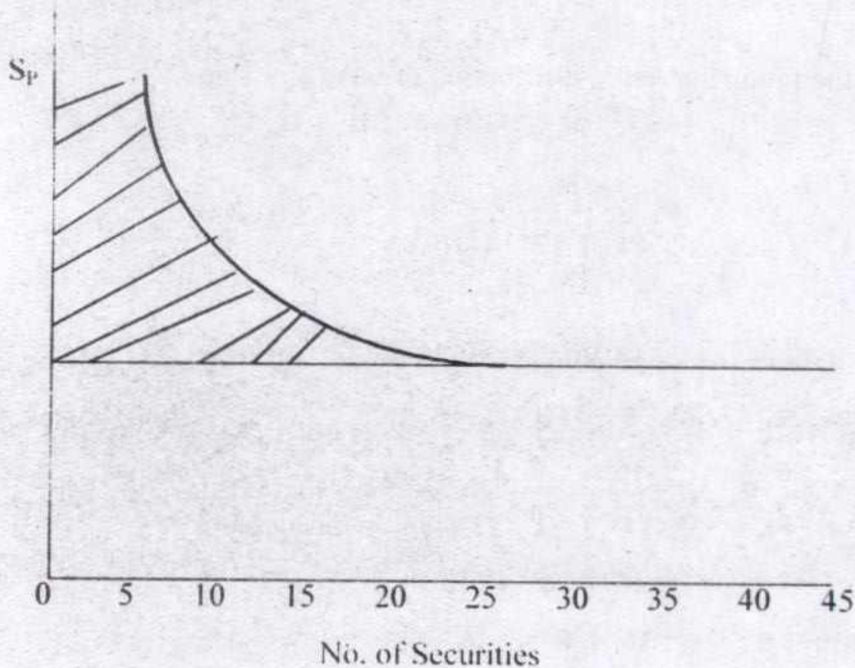
The securities are perfectly negatively correlated.

A 50:50 portfolio consisting of these securities would give a return equal to 27% throughout. As there is no fluctuation in portfolio return, we say there is no risk. And there is due to perfect negative correlation between these scrips.

Consider the following return distribution of securities 1 and 2.

Return of Security 1	:	x : 8 10 12 14 16
Return of Security 2	:	y : 18 20 22 24 26
(x-mx); mx	=	22: -4 -2 0 2 4
$(x-mx)^2$		: 16 4 0 4 16 mx = mean return of x &
(y-my); my	=	32: 4 2 0 -2 -4 my = mean return of y.
$(y-my)^2$		: 16 4 0 4 16
(x-mx) (y-my) =		: 16 4 0 4 16

Chart
Systematic and Unsystematic Risk



Correlation between returns of securities 1 and 2 is

$$= \frac{(x-mx)\,(y-my)\,/\,(n-1)}{(m-mx)^2\,/\,(\text{Sqr. root of } 40/4)\,(\text{Sqr. root of } 40/4)}$$

$$= -(40/4)\,/\,(\text{Sqr. root of } 40/4)\,(\text{Sqr. root of } 40/4)$$

$$= 10\,/\,10 = 1$$

A 50:50 portfolio consisting of these two scrips would give a portfolio return of 13%, 15%, 17%, 19% and 21% respectively for the 5 years year after year. This leads a std. deviation or return or a risk level of:

Sqr. root of $(x-mx)^2$ / N-1 = Sqr.root of $(13-17)^2 + (15-15)^2 + (17-17)^2 + (19-17)^2 + (21-17)^2 / (5-1)$ – Sqr.root of (16+4+0+4+16) / 4 = Sqr.root of 40/4 = 3.16

Thus with perfect positive correlation between returns of these securities, std. deviation is high at 3.16%. It was seen earlier when perfect negative correlation existed, there was no fluctuation in portfolio return or the std. deviation is nil. That is nil risk. We can show that portfolio risk is measured by std. deviation of portfolio return increases with positive correlation and decreases with negative correlation. Hence the relevance of correlation coefficient in the construction of portfolios.

Weight of Individual Securities

Weight or proportion of individual securities in the portfolio influences portfolio return as well as portfolio risk. High proportion of high risk security adds significantly to portfolio return and similarly high proportion of high risk security adds to portfolio risk significantly. By changing the weight of individual securities, different portfolios are constructed.

TIME HORIZON

An investor must have a time horizon. That is the duration of time during which he wishes to have his funds invested in a particular portfolio. Time horizon can vary from a few months to many years. Investment in general means a longer time perspective as against speculation which is for quick gains arising out of price movements. But of late the line of different between investment and speculation is getting thinned and the time horizon cannot distinguish between investment and speculation. So, time horizon in the case of

a genuine investor can be legitimately lower. Short or long, a definite plan of duration of time for which investment is to stand committed is needed.

The fund position, liquidity needs of the present and future, type of investment, the duration of the investment vehicles available in the market, market movement, riskiness of future time period, etc., influence time horizon.

Timing and time horizon are related. when to enter and get exited from the market actually decides time horizon. Delayed entry or delayed exist, for reasons not under investors' control lead to time horizon changed from planed one.

TYPES OF PORTFOLIOS

Portfolios can be classified according to: Objective, risk, level of diversification, basis of diversification, level of investment, geographical spread, industry spread and so on.

On the basis of objective sought, a portfolio can be income portfolio, growth portfolio, mixed portfolio, tax saving portfolio or liquidity portfolio. In income portfolio, the objective is maximum current income.

Growth portfolios stress on capital gain. Big investors, high earning professionals and persons in the higher tax brackets prefer this portfolio. Growth mutual funds, growth shares, etc. are included in the portfolio. Mixed portfolios give moderate preference for both return and growth. Salaried persons and middle income investors prefer this portfolio.

Liquidity portfolios emphasise on easy offloading. Frequently traded securities (with many quotations on the single day in stock exchanges), gilt-edged securities, by-back securities, etc. are included in the portfolio.

On the basis of level of risk

Portfolios may be aggressive (high risk), moderate (medium risk) or conservative / defensive (low risk). Investors interested in assuming high risk go for aggressive portfolios.

Aggressive portfolios have beta coefficients greater than + 1 or less than -1. beta coefficient is a measure of risk.

Moderate portfolios have risk more or less equal to that of the market portfolio. The beta of such portfolios is around

1. **Conservative portfolios** have far lesser risk than the market. Their beta coefficients are close to zero, say +.2 or with beta values ranging between – 0.5 and + 0.5, .3. Conservative portfolios will have a high load of risk free investments like bank deposits, govt. bonds, etc.

On the basis of level of diversification:

Portfolios can be classified into highly diversified, moderately diversified and lowly diversified. High diversification may be taken to mean that the portfolio has over 20 different securities in the kit. Moderate diversification includes 10-20 securities in the kit and low diversification means that less than 10 securities are in the kit. High diversification, if properly done, reduces the un-systematic risk to zero. In moderate diversification still

some un-systematic risk is present and low diversification means substantial un-systematic risk is present in the portfolio. Consider the graph-1.1. As number of securities increases, un-systematic risk reduces and hence total risk reduces. Beyond 20 securities, risk remains the same, as the systematic risk cannot be reduced. When you have more than say 25 securities, your portfolio is called 'superfluous' portfolio, indicating that it is diversified more than enough.

Based on geographical spread your portfolio may be a country-wide, regional level or multi-country portfolio. In a country-wide portfolio your investments are in companies / firms with operations in different parts of the country.

In the region wide portfolio, you restrict your investments to companies operating in one or few regions of the country. Say the south and the western India only. On the contrary, you may spread your investments across national borders.

Summary:

Investment is the sacrifice of current liquidity or current rupees for future liquidity. There are two concepts of investment viz., Economic Concept of Investment and Financial Concept of Investment. There are different investment goals which are of multiple in nature. Though there is conflicting nature of goals, goal congruity does exist. Investment may be of five major categories such as Financial, Real, Business, Personal and Institutional. Investment in group of assets / securities is called portfolio. This lesson further explains the need for portfolio management, types of portfolio, portfolio construction and also risk return trade off procedure.

Questions

1. What are the goals of investment
2. What are financial investments? What are their features?
3. What are real investments? What are their features?
4. What are business investments? What are their features?
5. What are personal investments? What are their features?
6. What are institutional investment? What are their features?
7. Compare investment. speculation. gambling and hedging
8. How are business investments evaluated?
9. Ultimate goal of investment is Return maximisation and risk minimisation. Comment
10. Explain the concept and need for portfolio management
11. Explain different portfolio goals
12. Present the different inputs for portfolio construction.
13. Explain the significance of correlation between security returns in portfolio management.
14. Explain the concept and use of concept the Time horizon
15. Give an account of different types of portfolios.

LESSON – 2

FINANCIAL INVESTMENT AVENUES

Having discussed the conceptual aspect of investment and portfolio approach of investment helps a lot for an investor in making optimal investment decision. The emphasis of this paper is on financial investments. Hence, this lesson gives an outline about various financial investment avenues.

Financial investments may be of the fixed income type, varying income type or derivative instrument. All the three forms are dealt below.

FIXED INCOME SECURITIES

Fixed income securities are preferred by risk-averse investors. The reasons are not far to seek. They are certain about the periodic return. There is protection of capita. That is, no value depreciation normally takes place. They have the priority to be discharged prior to shareholders. Security, fixed and/or floating charge on the assets of the firm is created to the delight of the investors. Under conditions of stock market depreciation people generally prefer to invest in fixed income securities. Fixed income securities need to be compusororily credit rated. So, investors can know what is the firm-specific risk they take when they invest in these scrips of a concern. Interest received tax exemptions upto specified amount together with dividend and similar incomes from scrips/deposits. So, cautions investors generally prefer fixed income securities, particularly in a depressed market.

But as fixed income securities lack secondary market, once and for all money is committed to the scrip, until redemption by whatever mode, ie: by

maturity, open purchase or by exercising call options. So, fixed income securities lack liquidity and this a biggest deteriment for investors. Also, if for any reason general rate of interest rises in the market, the fixed income securities carrying fixed and less than market rate of interest of similar risks, lose their enchantment. Of course, this is now being rectified by the introduction of 'floating rate' debt scrips. Credit rating, though brings to the notice of public firm specific risk, such rating is only relevant for a limited time frame. As debt scrips are longer term, the risk the investors take is not known in reality. For these and other reasons fixed income securities have slender demand. And that fixed income securities market is not generally the darling of investors.

From the point of view issueers of fixed income securities, there are some merits. Costs both floatation and service, are less than those involved in equity scrips. Second, debt finance has the flexibility of being returned if not needed unlike equity funds. Third, debt securities are the only sound means of raising capital. When the equity market is depressed. Between September 1995 and March 1998, debt securities were floated mostly by firms in India to raise capital in view of the depressed equity market that prevailed during the period. Fourth, interest paid on debt scrips is an allowable deduction from taxation angle. So, the post tax cost of debt securities is far reduced. Fifth, value of the firm that uses debt capital as against that of another firm of same features but fully equity financed is higher. Sixth, trading on equity is possible with debt financing. Seventh, dilution of management control does not result when debt finance is used as fixed income scrips do not have voting rights. Eight, in the case of firms facing inelastic demand for their products / services, debt capital is good for debt servicing is no problem, since risk of debt

financing is off-set y stability of income. Ninth. debt securities offer variety. Very many modified debt securities like redeemable and irredeemable. convertible and non-convertible. fixed and floating rate. secured and unsecured. registered and bearer. first and second mortgage. short-term and long-term. callable and non-callable, collateral and non-collateral, extendable and non-extendable. periodically amortizing and cumulative. debts with warrants and without warrants and the like are available. Tenth. legal formalities like (vetting by Securities Exchange Board) are less restrictive..

Thus there are very many advantages from the issuers point of view to go for more debt financing. But the market for debt securities is not wholly 'supply sided' The demand side is equally important. Investors preferring debt securities are limited. So, debt market is not big enough than the corporate issuers want it to be, in spite of added sweetness in the form of 'convertibility' and varieties. The 'warrants' carrying debt securities similar to convertible securities have some favour with the investors. As a result of these the use of debt by corporates pain India is 1:1 with equity though a 2:1 debt equity ratio is considered ideal. Further, some corporates as a policy do not use debt capital. They are satisfied with "all equity" status. Perhaps their EPS is so high, that they do not want to further rise it through the 'trading on equity route'.

Various Forms of Fixed Income

We have debentures / bonds. fixed deposits commercial papers. certificates deposits. treasury bills. etc. under fixed income category.

Domestic Debentures

Redeemable debentures / bonds are redeemed, that is, repaid after a period, usually 7-9 years. They have, therefore definite maturity.

Irredeemable debentures / bonds are perpetual and are repayable by a company only at the time of winding up of the company. These are, therefore almost like equity capital.

Convertible debentures are convertible into equity shares at an agreed price, at or after an agreed period. In an equity culture oriented market, selling straight debentures is difficult. Convertible debentures could be sold easily then.

Non convertible debentures / bonds remain as debentures throughout. There are partly convertible debentures also. Along with conversion, other options like subscribing to shares, etc. may be appended. Then the bonds are known as multiple option convertible bonds.

Fixed rate bonds carry a fixed coupon, ie. interest rate. Floating rate bonds carry a varying interest rate coupon depending on bank-rate/inflation-rate, etc. These are actually varying income securities.

Secured debentures / bonds are secured y tangible assets by equitable mortgage or registered charges. Unsecured bonds, also known as naked bonds, do not have any particular claim on any tangible asset.

Registered debentures or debentures whose transfer to new buyers requires a transfer deed to be executed by the transfer in favour of the transferor. Bearer debentures are transferable by mere delivery. They belong to the bearer. Such debentures are not very common.

First mortgage bonds are bonds who have a priority claim on the security given. Second mortgage bonds have only a secondary claim on assets given as security.

Short-term bonds are n currency for a short period, say upto 2 years or so. Long term bonds have life exceeding 2 years of more. The latter are more popular than the former.

Callable bonds can be redeemed prior to their scheduled maturity date by calling them for redemption. The terms of issue should reserve such right for the issuer. Non-callable bonds cannot be called for premature redemption.

Expandable debentures can be extended, ie.. their life is extended from one maturity to another maturity date. In fact they have a serios of maturity dates. If these are not presented. for redemption on a particular maturity date, they stand automatically posted for subsequent maturity. The rate of interest may be changed. Non-extendable bonds to not have the above facility.

Collateral bonds are bonds given as additional security to a creditor with the distinct understanding that the bonds shall come to life only in case of default in repayment of the liability. Non-collateral bonds are straight and simple bonds.

Periodically amortizing bonds are those that are redeemed periodically. say monthly through an EMI (Equated monthly instalment) formula. Cumulative bonds are bonds redeemed at the end of the maturity together with accumulated interest.

Debentures with warrants are those issued with warrants facilitating the holder to apply for preferential allotment of shares on a later date in return of the warrants.

There are deep discount bonds. whose issue price is highly discounted. given the fixed maturity value. No interest is payable in between however IDBI had issued such bonds.

Tax-free bonds are bonds. the interest thereon is not taxable. so. the coupon rate is lower than ordinary bonds. Public sector and government bodies generally go for tax-free bonds. Persons is higher tax brackets go for these bond investments.

Direct lien bonds are special bonds secured by one piece of property such as a dock, bridge, etc If the property is owned by two or more parties, then the bond is called 'joint bond' a bond with a security of a 'bridge' property as security may be called 'bridge bond' and so on . Prior lien bonds are bonds having a prior claim over even the 1st mortgage bond holders. When a company is taken over, the absorbing company might assume the liability of bonds of the absorbed company. Such bonds are known as assumed or guaranteed bonds. Participating bonds have a right to get additional return over and above the

fixed coupon if equity dividend exceeds certain predeetermined figure or when EPS exceeds figure. Sinking fund bonds are bonds. for the redemption of which a certain sum is periodically drawn from profits and invested outside the business. From sales proceeds of the investments, bonds are redeemed. Serial bonds are bonds with subdivisions posted for serial redemption. Put bonds are redeemable at the option of investor at a price known as strike price.

Finally commercial papers are also debt securities. albeit. short-term in nature .

Bonds floated in International Capital Market

Now bonds that are floated in international capital markets are described.

Bonds. For starters. there is a veritable plethora of securities. such as Euro bonds. Yankee bonds. Samurai bonds and dragon bonds which tap the European US Japanese. and Asoa Pacific markets. respectively. More specifically Eurobonds are unsecured debt securities maturing at least a year after the launch. Usually fixed rate instruments, with bullet repayments one shot redemption- these bonds are listed on stock exchanges abroad. And borrowers access global investors with deep pockets individuals with high net worth as well as institutions.

During 1995. the volume of Eurobond issues from the world's emerging markets hovered around the $30-billion mark. with the average size of an issue being $ 127 million. The most popular instrument among emerging market borrowers a Eurobond with a 144-A tranche. That is a public offering in the Euro-market and a private offering in the US.

Foreign commercial paper commercial papers are continuously offered unsecured debt by the borrower. Most FCPs mature in 30 or 60 days and are sold at a discount to their face value. That reflects the interest on the instrument as well as the overall yield to the investor. They are extremely flexible. since commercial papers can be structured according to different maturates amounts and rates according to the issuer's need for funds.

"Fixed / Floating Rate Notes": Instruments for lending for a period of one year to 18 months, fixed notes are better. For longer periods of one to five years. floating rate bonds are better. Again flexibility is the primary benefit: a note can be sold in small tranches. or in larger amounts, with different maturity periods. depending on the conditions in the market on the company's need for funds. Increasing Rate debt: This debt instrument matures in 90 days time, but it can be extended at the issuer's option for an additional period at each maturity data. simultaneously. the interest rate also increases. Several variations are possible; extendable bonds and stepped-up coupon puttable bonds. As the term suggests. extendable bonds have fixed redemption dates. However, the investor can choose to hold on to the bond for some more time, usually at a higher coupon rate.

As for stepped-up coupon puttable bonds. they are a hybrid between debt with warrants and extendable bonds or notes. After a specified period of time. investors can either put the bonds back up to the issuer or hold on to the bonds for a stated period at a higher-stepped-up coupon rate.

Flip-Flop Notes: A bond with reverse flexibility. A flip-flop note offers investors the option to convert to another debt instrument. And in some

cases, investors can even go back to the original bond at a later date. The option changes the maturity of the issue and the interest rate profile. It gives issuers the opportunity to pursuade investors to accept lower interest rates, thus reducing their costs. Conversely, investors have options which come in handy when interest rates fluctuate sharply. Dutch Auction Notes: Here, investors bid for seven-year notes on which the coupon rate is repriced every 35 days. As a result, the notes are sold at the lowest yield possible. bids are conducted through a real auction by dealers in the US markets. The main advantage is that these notes provide money for longer periods than commercial paper, since they are repriced only once every 35 days and, unlike commercial paper, are not redeemed and resold .

Bunny Bonds: These bonds permit investors to deploy their interest income from a host bond into more bonds with the same terms and conditions. Since the option to reinvest interest at the original yield is attractive to long-term investors, like the pension funds.

Euro-rupee Bonds: It doesn't exist yet, but several foreign institution are toying with the idea of cobbling together such a tool for wary companies. Denominated in rupees, Euro-rupee bonds can be listed in, say Luxemberg. Interest will be paid out in rupees, and investors play the risks of currency fluctuations.

Euro-Convertible Bonds: These are the most exciting Euro-option available. Equity-linked debt instruments, which can be converted into GDRs. ECBs represent the best of both worlds. And they may soon overtake GDRs in terms of their popularity in this country.

Traditionally, investors have the option to convert any such bonds into equity according to a pre-determined formula and, appropriately, even at a pre-determined exchange rate. Such bonds allow investors the flexibility to remain with the debt instrument if the share price refuses to rise. These bonds have also spawned subtle variations like those with call and put options, which allow the issuer to insist on conversion beyond certain limits or permit investors to sell the bonds back to the issuer. What's more significant are the structural variations that the Euro-market is becoming famous for.

Deep Discount convertibles such a bond is usually issued at price which is 70 to 80 per cent of less its face value. And the initial conversion price and the corporate levels are lower than that of a conventional Eurobond.

ECBs with Warrants: strictly speaking, these financial instruments as nothing but derivatives of Euro-bonds. They are a combination of debt, with the investor getting an option on the issuer's equity. The equity option, or warrant, is detachable from the host bond and it can be cashed after specific points of time. However, the bonds, which have a debt life of seven to10 years, remain outstanding until they mature. "There can be structural variations, or even derivative products which combine the risk, yield, and expectations of the issuer and the lender" For instance, they could be zero coupon bonds which carry a conversion option at a predetermined price, which are called liquid yield option notes.

Bull spread warrants: These warrants offer an investc, exposure to the underlying share between a lower level, L, and an upper level, U. The lower

level is set to provide a return to investors above the dividend yield on the share. After maturity usually three years, if the share price is below the level L, then the investor receives the difference from the company.

Compensating for the downside protection, the issuer can cap the up-side potential on the share. When it matures, if the issuer's share price is above the level U, the issuer has to pay out only the amount U. If the stock is between L and U on maturity, the issuer has choice of either paying the investor cash or delivering shares. As the minimum return is set above the dividend yield on shares, the structure works best for companies with a low dividend yield.

Money-back warrants (MBWs) : MBWs entitle an investor to receive a certain predetermined sum from the issuer provided the investor holds the warrant until it matures, and does not convert into shares. To the investor, the cost of doing so is not only the cash he loses, but also the interest foregone on that sum of the money. This means that companies must offer a higher premium than they normally do.

The above descriptions of various debt investment options available for overseas investors reveal the umpteen investment avenues available for an investor.

Other Fixed Income Securities

Certificate of Deposit is another fixed income security popular in money market where issuers (mostly banks) issue deposit certificates are discounted values maturing to a specified round sum. Treasury Bills and Bonds are issued by the Governments to raise funds. There are 14 day T-bills, 91 day

T-Bills, 361 day T-Bills and dated long term and medium term T-bonds giving fixed yield.

Debt Market Securities

Market for debt securities is an important segment of financial security segment. Debt market development is necessary for increasing the popularity of debt instruments. Investors in debt securities should not be left without a secondary market for the securities. The market capitalisation of debt is put at 42% of GDP. In rupee terms it is about Rs.3,50,000 crs, including the internal debt of the government and corporate sector. Such a vast segment, however, has no retail or secondary market. Attempts at creating one such market have been initiated when the National stock exchange was established in 1994. It was primarily meant to increase market for debt securities. And there is increasing concern now in creating a debt market, big and broad in India. Indresh Batra gives the reasons for this.

The government is now borrowing at market rates. Coupled with this, declining returns in equity markets are forcing investors to take closer look at debt. The bearish phase in the market not withstanding, equity markets in India have attained some kind of maturity over a period of time. This will restrict possibilities of super normal returns from equities, therefore restricting opportunities of arbitrage.

Factors on the supply side are also positive. One, the huge infrastructural requirements in future. Since all the projects being sought to be implemented by companies require huge investments and have a long gestation period, they are likely to be financed through debt. This can being about a

deepening of the debt market in terms of the number of instruments available. Yet another factor is those companies planning expansions and diversifications will be chary of a further dilution of their earnings through equity expansion.

They too, are expected to scour the debt market as an option in financing these projects. Recently some companies have shelved the plans to come out with public equity issues, and are exploring the option of debt market. Also some corporates and PSUs coming out with bond issues are contemplating the merits of tapping the retail investor segment. This decision is being forced by two factors. One, the huge demand of the government which has come to the market with ever increasing yields, sucks out. Liquidity from the market, second the gradual lowering of SLR parequirements by the RBI over the years. Due to this, banks and other financial institutions have not been much interested in SLR securities, choosing, instead, to place their money in other high return assets and securities.

Since the proportion of individual investors who invest on their own in the debt market is miniscule, it is through the emutual fund route that they invest in the debt market. Further it has been seen that those mutual funds which have performed better than the other funds.

This might be due to the sorry state of the equity markets. By their sheer popularity it is clear that there is a big section of investors who are interested in fixed regular returns with very high safety. A case in point is that of JM Mutual fund which has invested the maximum in the debt portfolio.

Among all its schemes, the liquid fund has performed the best. The major shot in the arm came from the setting of the National Stock Exchange (NSE). After all, all the conditions for the development of the debt market were there, and with the setting up of the NSE in '94, this market took from. Until then, the Bombay stock Exchange (BSE) was the principal exchange on which corporate debt instruments were listed. But these were hardly traded and quotes were even less indicative. All the trading was through off-market deals.

To boost trading volumes on the exchange, the government directed commercial banks to undertake trading through brokers registered with the NSE. However, the concept of the screen-based trading has to find acceptance among investors and brokers in the nascent bond market. Both the brokers and market observers point out that deals that are posted on the NSE are actually struck over phone. Though this is not to say that the trend of screen-based trading is not picking up.

The other major development in widening the investor base is the difficult task of making the individual investor an active player in this market, has been achieved. After a long wait, the NSE has listed debentures on its capital market segment, hetherto listed on the wholesale market segment. These debentures are 30 in number and have started trading as recently as the first week of August of 1995. This is definitely expected to boost the retial investor's entry into this segment.

In addition, trading on the Bombay on line trading (BOLT) system has definitely made trading in debentures easier for the individual. Now, one gets regular quotes of BOLT. Though the percentage of these debentures is small, as

compared to the total number of debentures listed, the situation is definiteely changing in favour of the former.

For small investor, it is still more preferable to trade through the OTC exchange. Though the yields here might be lower due to the intermediary interest, there is the much-needed liquidity due to the presence of market makers. Transparency is also one of the major concerns of investors. For now, with all the major exchanges BSE, NSE and the OTC dealing in debentures through screen based trading investor opportunities have definitely increased.

Rajiv Handa gives further reasons for the growth of debt market in an article Global debt market form an informal trading area without there being a requirement to have a built market for trading. The advantage of an official debt market, however, makes settlement and clearing simpler. Since liquidity and an effective secondary market are of vital importance, the market should be broad based.

The provident funds have recently been allowed to invest 15 percent of the funds within their ambit in PSU Bonds (Against earlier requirement to keep 70 percent in bank special deposits now only 55 percent would be henceforth required).

Similarly the RBI has withdrawn the ceiling of 5 percent, placed upon PSU Bond purchases by banks, and additionally allowed banks to invest upto 5 percent of their incremental deposits in private sector securities. The banks have also been allowed of finance the market makers in debt instruments on a selective basis. These relations would add liquidity to the market.

''s have been allowed to place upto 30 percent of their investible funds in debt instruments. Considering that the FII investment in the stock markets is approximately $2.0 billion, about $600 million could possible go into debt instruments. This would add liquidity to the secondary market. Now even 100% debt investment by FIIs is allowed. But there are problems. The current low liquidity in the debt market denies an easy exit. This, coupled with non-convertibility of the rupee on capital account would ensure that FIIs abstain. Further, there is non existent standard settlement cycle. And finally, the debt markets are thin, with long-term exercise.

The only factor in their favour is the prevalence of high interest rates in the domestic markets, which allow sufficient arbitrage opportunities. Here gain rising interest rates in the West along with rising bond yields, have made emerging markets less attractive. The problems of currency exposure and withholding tax on interest income are still to be sorted out.

Just like elsewhere, corporates have large surpluses available to them from time to time. These funds are not, per se, parked in debt instruments as alternate investment options have large interest spreads amongst them. While 91 day treasury bills offer of return of 9 percent, inter-corporate deposits can provide as much as 25 to 28 percent for the same tenure. There is not incentive on the part of a corporate investor to thus go in for debt instruments. This is another negation of the debt market within the country.

ICICI former chairman N. Vahul said that reforms in the debt markets were lagging behind the capital market reforms. With industrial growth rate set to scale an all time high of around 10 percent or even more, and different

sectors showing divergent growth patterns like steel growing at 8 percent, cement at 8-9 percent and consumer goods a jump of between 40-50 percent, selective sectors would need major capital investments just to keep pace. For instance the power sector would need an investment of over Rs.28,000 crore over the next few years, and so would communications and infrastructure. Corporate cannot live on equity alone in future.

Restrictions on commercial papers need to be removed so that volume of trade in debt instruments picks up. The absence of transparent trading and settlement mechanism is the single most reason for the nondevelopment of a secondary market. There must be clear norms for settlement and transfer of bonds acceptable to all players.

Integrated debt and money market work, with the banks, the Central Bank, the dealer, the buyer and the seller moving in and out of market taking positions all the time creating liquidity in the secondary market and making the interest rate move strictly and essentially on demand and supply factors. The result is that stock and debt markets move together. In their movements they reflect the liquidity in the system, future direction of interest rats and equity yields.

However, while the return on face value is fixed, investors may end up with a high yield as the instrument is sold at a discount to face value in the secondary market. For this reason, avoid primary issues of NCDs and rather pick them up at a discount from the secondary market. This way there would be no lose of capital and yield to maturity would be much higher. Further investors should decide upon their own yield expectations, holding period or

tenure, which sit comfortably with their risk exposure. The outlook on the whole appears promising. For one, volumes will rise in future. With the opening up of NSE, the market activity will pick up as at some stage equity would have to be substituted with debt. Liquidity in the market would improve with the arrival of larger players.

Prefernce Shares

Preference shares, as the name implies,. are shares which enjoy preference over other classes of shares in the matter of payment of dividend and return of capital. The rate of dividend on a preference share is fixed. But if any dividend is declared by the company at all, dividend is paid to the equity shareholders. However, the directors have a right to declare no dividend at all. Preference shares also get preference in the matter of return of capital when the company goes into liquidation. According to Sec.85 (1) of the companies Act. preference shares.

(a) Carry a preferential right to be paid a fixed amount or an amount calculated at a fixed rate, free of income tax or subject to income-tax and

(b) Carry a preferential right to be repaid the amount paid-up or deemed to have been paid-up in the event of winding up or repayment of capital, whether or not there is preferential right to the repayment of either of the following amounts, viz. (I)any money remaining unpaid in respect of dividend up to the date of winding up or repayment of capital, and (ii) any fixed premium on a fixed scale specified in the memorandum or articles.

Preference shares may be of several types. viz (a) non-cumulative preference shares. (b) cumulative preference shares. (c) preference shares. (d) non-participating preference shares. (e) redeemable preference shares. (f) irredeemable preference 1 share. (g) conversible preference share. (h) non-conversible preference shares and (I) cumulative convertible preference shares.

(a) Non-cumulative preference shares:

These shares get preference in the matter of payment of dividend at a fixed rate in any year. only if there is any profit available for distribution in that year. If there is no profit or inadequate profit in any year. preference dividend cannot be paid and the arears of dividends will not accumulate. That is. if the holder of these shares do not get preference dividend in any due to inadequate or no profits. they cannot claim payment of the arrears of dividends out of the profits of any subsequent year.

(b) Cumulative preference shares:

In the case of these shares if dividends at the fixed rate cannot be paid in any year. due to inadequate profits. arrears of dividends will accumulate and will have to be paid out of the profits of future years. That is. if the company makes sufficient profits in any subsequent year. the accumulated arrears of dividends will have to be paid off along with current dividend. However. if the company goes into liquidation no arrears of dividends are payable unless such dividends have actually been declared on the Articles provide for such payment.

(c) Participating preference share:

Like other types of preference shares, these shares also enjoy the right of getting a fixed rate of dividend in preference to other classes of shares. But in addition to that the holders of these shares are also entitled to a further share in the surplus profits after dividend at a certain rate has been paid to the equity shareholders.

(d) Non-participating Preference Shares:

These shares do not have right to participate. Under the companies Act all preference shares are deemed to be nor-participating unless the articles expressly give this right of participation in surplus profits.

(e) Redeemable preference shares:

Ordinarily, the amounts paid on the shares are not redeemable (refundable) except when the company goes into liquidation. But the Companies Act. 1965, allows a public limited company to issue preference shares subject to certain conditions, the amount of which may be redeemed during the life-time of the company. These are known as redeemable preference shares. Under Sec. 80 of the Act, a company may issue such shares subject to the following conditions.

1. That the Articles must permit the issues of such shares.
2. That no such shares shall be redeemed unless they are fully paid up.
3. That such shares shall be redeemed only out of profits of the company available for dividend or out of the proceeds of a fresh issue of shares.

4. That the premium, if any, payable on redemption shall be provided out of the profits of the company or out of the company's share premium account: and

5. That where the redemption is made out of profits, an equivalent sum shall be transferred to a Capital Redemption Reserve Account (Sec.80(1).

A new condition for the issue of redeemable preference shares had been inserted by the Companies (Amendment) Act, 1988. Under the new sub-section (5-A) of Sec.80, added by the 1988Anebdnebt, Act, shares which are redeemable after the expiry if ten years from the date of its issue. A new sec. 80 -As has also been added, which provides for compulsory redemption of all unredeemed preference shares within five years from the commencement of the Amendment Act for 1988.

(f) Irredeemable Preference shares:

These are not redeemable during the life time of the company. Presently, these shares are not in vogue.

(g) Convertible Preference Shares:

These are converted into equity like convertible bonds. These may be fully or partly convertible.

(H) Non-convertible Preference Shares:

These are not convertible. Ordinarily unless expressely provided, otherwise preference shares are non-convertible.

(I) Cumulative convertible preference (CCP) Shares:

A new type of preference shares, known as cumulative convertible preference shares, has been introduced by the Government of India by a notification issued in 1985. These shares can be issued by companies to raise finance for modernisation. As projects, for expansion, diversification, normal capital expenditure for modernisation, as well as working capital. The face value of such shares will ordinarily be Rs.100 and the rate of dividend would be 10 per cent. The CCP shares can be issued to the extent the company issues equity shares for public subscription. The entire issue is compusolity convertible into equity shares after the end of 3 years and before the end of 10 years. After conversion the holders of the equity shares are entitled to receive the arrears of preference dividend if any.

Preference shares are not, however, preferred by investor nor by issuers. Not even 1% of total capital of Indian companies is obtained through preference shares.

Equity Shares

Equity shares are predominant form of investment for risk seeing investors. Shares which do not enjoy any preferential right in the matter of payment of dividend or repayment of capital are known as equity shares. Dividend is paid to the holders of these shares after the preference dividend at a

fixed rates has been paid. The rate of dividend payable on these shares is not fixed and may vary form year to year depending upon the amount of profits available and the intention of the Board of Directors. On the liquidation of the company, the amount of equity capital is repayable only after all other claims including that of the preference share holders, are satisfied. However, these shares have the right to receive the surplus dividend and surplus capital, if any, after the claims of others have been settled.

Subject to the provisions of Sec.89 and Sec.92(2) of the companies act a holder of equity shares shall have a right to vote in respect of equity capital on very resolution placed before the company. Moreover in a voting by poll his voting right, shall be in proportion to his share of the paid-up equity capital of the company. As compared to this, the holder of preference shares ordinarily has voting rights only on resolutions which directly affect the rights attached to the preference shares. However, if the preference dividends have remained fully or partly unpaid, then the preference share holder shall have voting right on every resolution placed before the company.

Shares can also be classified as blue-chip shares, forward list shares, uncleared shares etc. Blue-chip shares are most preferred ones. They gives capital appreciation like growth shares as well as current return. These are in continuous demand in the market. Most of the MNC scrips are blue chip. Forward list shares are these in which forward trade is allowed. This feature adds colour to these scrips. Their prices rise as their status rises. Recently (early 1998). Global Trust Bank got moved to forward list and it gained over 50% rise in market value. Uncleeared shares are spot market shares. Trade volume and liquidity are limited.

Growth Shares

Shares of companies that have a fairly entrenched position in a growing market and which enjoy an above-average rate of growth as well as profitability are characterized as growth shares.

Income Shares

Shares of companies that have fairly stable operations with relatively limited growth opportunities may be characterized as income shares.

Cyclical Shares

Shares of companies that have a pronounced cyclicality in their operations are referred to as cyclical shares.

Defensive shares

Shares of companies that are relatively unaffected by the ups and downs in general business conditions are referred to as defensive shares.

Speculative Shares

Shares that tend to fluctuate mainly because there is a lot of speculative trading in them may be characterized as speculative shares.

MUTUAL FUNDS

Discussed Earlier in the [redacted] lesson I.

FLOATING RATE BONDS

Floating rate bonds, medium terms and long term, are available which carry a coupon that is linked with some benchmark rate take Bank rate or LIBOR or the Prime Lending Ratio. These are popular in the developed money markets where market forces play a great role.

DERIVATIVES INSTRUMENTS

Derivative instruments are derived from prime instruments-here the share, bonds and the like. Actually the shares and debentures are themselves derived from physical assets of the issuing concern. There are different types of derivative instruments, viz, options, futures, warrants, rights and convertibles. These securities are called derivatives, as the value of these securities are derived in part from the underlying asset-ie; the share or the foreign currency on which these are written. Let us explain the derived instruments or derivatives in some detail.

Option

An option is, as everyone knows, a right to do or refrain from doing certain thing. Normally in any trading, two parties are involved – a seller and a buyer. The seller agrees to sell and the buyer agrees to buy. The seller is under obligation to sell and the other is under obligation to buy. Can there be any transaction with the seller having obligation to sell, while the buyer having only

an option (or right) but not obligation to buy? Yes such transaction is precisely an option transaction.

In an option transaction one party, known as the writer on the option, sells (hence a .k.a seller) an option to the other party (known as the holder or buyer of the option) to buy or to sell or to either buy or sell or both buy and sell, as the case may be a specified asset, of specified quantity at a specified price, delivery given/taken (if need be) on a or within specific future date.

Say 'S' the seller is giving a option to "B" the buyer of the option, whereby 'B' is entitles to but not under obligation, buy 100 shares of XYZ Ltd.at Rs.100 each. This is known as call option. If "B" is given the option to (but not obligation) sell 100 shares of XYZ Ltd. At Rs.100 each. such option is known as put option. If 'B' is given the option to (but not obligation) either buy or sell 10 shares of XYZ Ltd. At Rs.100 each, then the option is call and put option. The price viz Rs.100 per share is known as the strike or exercise price. If the option is exercisable anytime within the stipulated ate, it is known as American optlon and if it is exercisable only on the stipulated date, it is known as European option. From the words "American and European" it is evident. option trading originated in the west. Of course now in the developed Asian nation, option trading is practised.

Option trading is not confined to stocks. In commodities market, in the foreign exchange market, in the finance market, etc. option trading is carreid on. Option trading is standerdised as to size, time, etc. and the options exchange (like stock exchange) interposes between the wiiteer and holder of options so that each party settles the deal to the exchange. And this adds credibility.

Varieties

On the basis of objectives, options trading can be for hedging or speculative purposes. On the basis of the underlying financial asset, options can be classified as scrip or stock options, commodity options, currency options and futures options. On the basis of primary forms, options can be call, put and call and put. And there are several high-breed options as well. This papers deals with varieties of stock options.

Call Option

A call option is an option to buy, and not obligation a to buy stock at the agreed exercise price (EP) by or within a specified date. Say, a gives B an option to buy a RIL share for Rs.400 by 3 months from now, for an upfront commission on premium of Rs.20 payable now. Three months later if RIL share price (LP) is higher than Rs.400 B will exercise the option. If it goes below or remains at Rs.400, B will allow the right he has unexercised. His gain is maximum of (LP-EP) 0. How is this useful to B? B benefits when RIL share goes up beyond Rs.400. Otherwise, his loss is limit to the Rs.20 upfront commission paid. In the following table 1 the pay off of call option are presented for different price levels of RIL share in 3 months

Table 1 : Call Option Holder's Payoff (Figs. Rupees)

1. LP :	380	390	400	410	420	430	440	450
2.Max. of (LP-EP),0:	0	0	0	10	20	30	40	50
3.CC paid :	20	20	20	20	20	20	20	20
4.Net pay off(2)-(3):	-20	-20	-20	-10	0	10	20	20

B with the help of his option trade, limits his loss to a maximum of Rs.20 in case the RIL share does a downswing below Rs.400. but books open ended reward with the share making upswing beyond Rs.400. Between Rs.400 and Rs.420, he simply recovers the Rs.20, CC (read call commission) paid. As RIL share goes beyond Rs.420, net positive pay off results.

A bull operator, who buys now with the hope of selling at a higher price later, will be exposed to unlimited loss if his calculations on price movement get reversed. However, with a call option as an alternative to long position he can reduce risk, while profit opportunity as such is not dimmed. Hence the use of call option for speculators.

Take an investor. He wants to buy RIL shares three months from now. If he waits the time and enters the market by 3 months, he may have to run the risk of paying higher price. Through call option route, at exercise price of Rs.400 per share and CC of Rs.20, his purchase price is fixed at Rs.420 a share if the share goes high enough. If price goes down the investor can purchase the

share from the open market he loses the call premium paid. Whatever the prevailing price then, the investor can get the share for on overall price, not exceeding, Rs.420. Hence the use of call option for an investor. For the option writer, pay off is the mirror image of the pay off of the option holder.

Put option

A put option gives to the option holder right to sell a stock at an agreed exercise price; for an upfrot commission payable to the option writer. Say A gives B an option to sell RIL share for Rs/400, 3 months from now, for upfront commission of Rs.15 payable now. So, EP=Rs.400 and put commission =PC=Rs.15. If price of RIL goes above Rs.400. B will not exercise the option and will sell in the open market to realise a higher price. But he loses the PC paid. If the 3 months price of RIL is less than Rs.420. B will exercise the option. Thus the gain for B is maximum of (EP-LP) 0. For different 3 moth's later prices (LPs), the pay-off to the put option holder is as follows in Table 2.

Table.2: Put option Holder's pay off (Fig.Rs.)

1. LP	:	360	370	380	390	400	410	420	430
2.Max.of(EP-LP),0	:	40	30	20	10	0	0	0	0
3.PC paid	:	15	15	15	15	15	15	15	15
4.Net pay off(2)-(3)	:	25	15	5	-5	-15	-15	-15	-15

For a plain speculator, when later period price goes above the EP, ie.Rs.400, he will allow his option to lapse and his maximum loss in the commission paid, Rs.15. If price falls below EP, further and further, B gains more and more. So if the speculator B expects a fall in price, he can buy put option and benefit. He can book good profit when price goes the way he had foreseen. If it moves otherwise, his loss is limited to the PC paid.

An investor can also benefit from a put option. We the stock price freely falls in the future, by exercising his option he can book gains. If prices rise, he need not exercise the option and sell in the open market. He of course, loses the put commission paid, in any case. A net price (net of PC, the commission) of Rs.385 (Rs. 400 minus Rs. 15, ie. EP-PC) is guaranteed. Thus his realisation per RIL share is RS.385 or more in any case. For the option writer the pay off is the reverse of that of the option holder.

Call and Put option

The option holder with a call and put option, can buy or sell the share at the EP for the option commission (OC) paid upfront, which is equal to the call commission plus for the put commission. Say a call and option on RIL, 3months, with EP = Rs.405 is said for Rs.35. whatever way, later period price, LP moves the option can be exercised. But the stock must be volatile enough. The pay offs diff LPs are given in table 3. When LP is less than Rs.405, put option is to be exercised an when LP are given is more than RS.405, call option is to be exercised.

Table 3. pay off for holder of call and put option (fig. Rs)

1	LP	350	370	385	395	405	415	425	450	460
2	EP-LP:LP-EP (for positive values)	55	45	20	10	0	10	20	45	55
3	OC paid	35	35	35	35	35	35	35	35	35
4	Pay off(2)-(3)	20	10	-15	-25	-35	-25	-15	10	20

In any case the option is exercised. There is loss to the holder only when the scrip is less volatile and its LP is around the EP. For further drifts in LP from the EP, the holder stands to gain a lot. Put and call combination is also known as straddle. To the option writer, the pay off is opposite of that of the option holder.

Other Hybrid Options

There are other hybrid options like, straddle, strangle strips, strap, land spread. These are dealt below.

Straddle is nothing but a combinations of call and put options for same exercise price, for same expiration period for the summed up premiums. This type of call and put option is already dealt with.

Strangle is a combination of call and put options for different strike prices. For instance, a call for an EP of Rs.400 and a put for an EP of Rs.420. Here the option buyer feels the price of the stocks is more likely to fall than ro rise. If later period price is between Rs.400 and Rs.420, both the call and put legs of the option will be exercised. If that price is less than Rs.400 only put

portion will be exercised and when price exceeds Rs.420, only call portion will be exercised.

Table 4 gives the pay off for the strangle, for the option holder.

Table 4: Pay off for a strangle to the holder (fig.Rs.)

1	LP	350	370	390	400	410	420	430	450	470
2	Pay off of put EP = 420	70	50	30	20	10	0	0	0	0
3	Pay off of Call EP = 400	0	0	0	0	10	20	30	50	70
4	Total pay off	70	50	30	20	20	20	30	50	70
5	OC (20+15)	35	35	35	35	35	35	35	35	35
6	Net pay off (4)-(5)	35	15	-15	-15	-15	-15	5	15	35

Strangle is superior to a straddle for peakedness in loss to the holder is avoided, because when the strip's later period price is not as volatile as expected to be, both the call and put legs of the option are exercised limiting loss.

Strip option involves buying two puts and one call on the same stock, at same EP and same expiration period. Obviously strips are speculatives. The

buyer of strip feels stronger that the stock will fall than that it will rise. So he goes for two puts and one call. The premium for strip option =premium for 2 puts plus premium for one call. The pay off is worked out as in table 5 for hypothetical figures. For the writer of a strip. the pay off is the reverse.

Table 5 : Pay-off for a holder of a strip : EP=Rs.405.Fig.Rs.

1	LP	350	370	390	405	420	440	460	480
2	Max 2 (EP-LP).0	110	70	30	0	0	0	0	0
	Max.of(LP-EP)0(LP-	0	0	0	0	15	35	55	75
3	Total	110	70	30	0	0	0	0	0
4	OC paid (15+15+20)	50	50	50	50	50	50	50	50
5	Pay off(3)-(4)	60	20	-20	-50	-35	-15	5	25

Strap is opposite of strip. Two calls and one put options when combined a strap is obtained. The exercise price, expiration date, etc are all same. Buyer of a strap feels stronger that the underlying assets has more chances of appreciation than value depreciation.

For table 5 case, "Strap" results are worked out in table 6.

Table 6: Pay off to holder of a strap (Fings. Rs.)

1.	LP	340	370	390	405	420	440	460	480
2.	Max of (EP-LP).0	65	35	15	0	0	0	0	0
3.	Max of (LP-EP).0	0	0	0	0	30	70	110	150
4.	Total pay off	65	35	15	0	30	70	110	150
5.	OC paid (15+15+20)	55	55	55	55	55	55	55	55
6.	Net Pay off (4)-(5)	10	-20	-40	-55	-25	15	55	95

As later period price rises, the strap gives more profit. You may notice strip is more profitable when later period price falls. Thus strip and strap are opposites.

'Spread' Options

Thus for, we considered an option or more options either bought or sold by a person. In other words, a person happened to be either writer or buyer of options. If the same person writes (ie. sells) an option and buys another option, he is said to be "spreading". Thus spread strategies involve synthesis of writing and buying same type of option at different exercise price. That is, one option is bought while the other is sold. Exercise price is different for the 'written' and "bought" legs. But, expiration date is same for the options traded.

Bullish call spread involves buying a call with low exercise price and selling a call with high exercise price. On the bought component initial outflow is involved and in the written component initial inflow is involved. Thus spread strategies help reducing initial outlay. The person is bullish about the underlying asset. If his calculations go correct, he can buy the stock at the lower exercise price. On the written call, if later period price exceeds the EP, a loss is to be booked otherwise, there is only gain the commission received. Table 7. presents the pay off. Let EP for the bought call be Rs.410, for commission Rs.20; and EP for sold call be Rs.430, commission being Rs.15. The net commission = Rs.5.

Table 7 : Pay off on Bullish call spread (Fig. Rs.)

1.	LP	370	390	410	415	420	430	440	450	470
2.	Bought call (Max. (LP-EP),0	0	0	0	5	10	20	30	40	60
3.	Sold call	0	0	0	0	0	0	-10	-20	-40
4.	Net commission	-5	-5	-5	-5	-5	-5	-5	-5	-5
	Pay off	-5	-5	-5	0	5	15	15	15	15

For later period price below lower of the exercise prices of the calls transacted there is a net loss, but a fixed loss of Rs.5 only. For later period price falling between the two exercise prices, diminishing loss, break-even position and entry into profit zone do happen in order with rising LP. As LP reaches the higher of the two exercise prices, profit reaches the maximum and thereafter it remain same for all higher LPs.

Bullish put spread involves buying a put with low exercise price and selling a put with high exercise price. Say the person buys a put with EP = Rs.410 and sells a put with EP = Rs.430. The premium for the former be Rs.15 and for the latter be Rs.20. There is a net premium receipt of Rs.5. The person strongly believes the market will rise beyond Rs.430. The payoffs are worked for different LPs in table 8. If his calculations are correct he makes a profit equal to net positive commission received. If price goes below the lower of the two exercise price a net loss, that too fixed at that, is booked. Not a profitable strategy.

Table – 8 : Payoff of Bullish put spread

1	LP	370	390	410	415	420	430	440	450
2	Bought put Max of (EP-LP).0	40	20	0	0	0	0	0	0
3	Written put	-60	-40	-20	-15	-10	0	0	0
4	Total	-20	-20	-20	-15	-10	0	0	0
5	Net commission	5	5	5	5	5	5	5	5
6	Pay off	-15	-15	-15	-10	-5	5	5	5

Bearish call spread involves writing a call for lower EP earning a higher commission and buying a call for higher EP paying lower commission. There is net positive commission. The trader is bearish and his only possible source of income is net commission received. Let the written call have an EP of Rs.410 giving a commission of Rs.20 and bought call have an EP of Rs.430 with commission paid Rs.15. Net commission income is Rs.5. Table 9 presents the pay offs and net pay off.

Table 9: Pay off of Bearish call spread (Fig.Rs.)

1	LP	370	390	410	415	420	430	440	450
2	Bought call Max of (LP-EP),0	0	0	0	0	0	0	10	20
3	Sold call	0	0	0	-5	-10	-20	-30	-40
4	Total	0	0	0	-5	-10	-20	-20	-20
5	Net commission	5	5	5	5	5	5	5	5
6	Net pay off	5	5	5	0	-5	-15	-15	-15

If later prices goes down, the trader benefits with income equivalent to net commission. This is what he aspired for. If price rises beyond the higher of the two strike prices involved, a fixed loss befalls the trader.

Bearish put spread involves to puts – buying a put with higher EP and writing a put with lower EP. Let the commission for long put (ie. bought put) be Rs.20 and commission for short put (ie., sold put) be Rs.15, giving a net negative commission of Rs.5. Let the EP for long put be Rs.430 and that for short put be Rs.410. The pay offs for different LPs, are given in table 10.

Table 10: Pay off for bearish put spread (Fig.Rs.)

1.	LP	370	390	410	415	420	430	440
2.	Bought put Max of (EP-LP),0	60	40	20	15	0	0	0
3.	Sold put pay off	-40	-20	0	0	0	0	0
4.	Total	20	20	20	15	0	0	0
5.	Net commission	-5	-5	-5	-5	-5	-5	-5
6.	Net pay off	15	15	15	10	-5	-5	-5

If as expected LPs are moving down a profit, but fixed one is made. If prices move northwards, a loss equal to net commission paid results.

Synthetic options:

Now a case of buying a call and selling a put is involved (In the spread strategies dealt above buying calls or puts and selling calls or puts were only

involved. In straddles either buying a put and call or selling a put and call are involved) Synthetic options are done at the same EP, but commissions differ.

Let a call be bought and put be sold, both at EP Rs.410. Let the commission on the long leg be Rs.20 and the short leg be Rs.15. So, there is a net out go of Rs.5 when the synthetic was entered into. The pay off of the synthetic is given in table 11.

Table 11: Pay off of Synthetic Option (Fig. Rs.)

1.	LP	370	390	410	430	450	470
2.	Bought call (Max of (LP-EP), 0	0	0	0	20	40	60
3.	Sold put	-40	-20	0	0	0	0
4.	Total	-40	-20	0	20	40	60
5.	Net commission	-5	-5	-5	-5	-5	-5
6.	Net pay off	-45	-25	-5	15	35	55

Synthetic options do not help in loss minimization. Consequently no lid on profit is also involved. Hence these are risky.

FUTURES

Futures are already presented in Unit I. The operation of futures are presented below.

Futures are to be operated only through organised futures exchanges. The clearing house interposes itself between the parties and that the contract is

eventually made into two contracts-Party I with the Cleaning House (CH) and Party II with the Cleaning House. Thus if A agrees to sell to B, actually it is written as: A agrees to sell to the CH and B agrees to buy from the CH. The parties have to make maintenance margin money normally equal to 5% of the value of the contract. Say, the value of the contract is Rs.20000. Then each has to deposit Rs.1000 with the clearing house. Every day the contract is marked to marketed to market and profit credited to the gaining party and loss debited to the losing party. The gain can be withdrawn. The loss reduces the margin. If margin goes below, say 50% of the maintenance margin, then a "call margin" is given and the party has to make up his margin credit to the maintenance margin level. Futures contracts mature in specific months only- March, June, Sep and Dec and 3rd Friday of respective month. On the settlement day 99% of the contracts are reversed and closed.

WARRANTS

Warrants are rights available to their holders to state a claim for the underlying asset on a future date. Warrants are separately listed and traded. Each warrant will exchange for one unit of the asset (ie., a share) and you have to pay the price for the share. The price may be fixed in advance or announced about the time the warrant is redeemed for the underlying asset. Warrants have to ad are protected against stock splits and bonus shares. Say a company, subsequent its warrants issue, had subdivided each share into two shares. Then, a warrant holder is entitled to exchange the warrant for two subdivided shares on paying the exercise price.

The value of the warrant depends on the exercise price (EP) or the expected excessive price (EEP) and the going market price of the underlying

asset. If the EP or the EEP is < the market price, the warrant has a positive value maximum to the extent the difference.

Warrants may be issued in lieu of dividend. Warrants may be issued in order to "sweeten" the sale of shares or bonds. Warrants may be detachable or non-detachable, except upon exercise. If it is detachable it can be freely listed and traded. If it is non-detachable, when the underlying asset is sold, the warrant is also sold or it must be exercised. Usually, if at all, warrants accompany bonds in order to boost subscription to bonds issue. Later on exercise of warrant, if it is provided for, the bonds at their face value may be exchanged together with warrants for equity shares. Warrants resemble like call options, ie., if exercise price is lower than market price of the underlying asset, it is exercised.

CONVERTIBLE SECURITIES

Convertible securities include convertible debentures (CDs), convertible pref. Shares (CPs), etc. CDs can be partly or fully or optionally convertible into equity shares. CPs can be similarly partly, fully or optionally convertible. We have already discussed these in Unit I. Convertible securities give the investor initially fixed return and later on conversion might give capital gain. When a company issues convertible bond, the conversion date, the conversion price, the conversion ratio, etc must be indentured. Say, a company issues convertible bonds of Rs.60 each, convertible into 3 shares are exchanged. The conversion price is, the face value of the bond divided by conversion ratio, ie., Rs.60/3 = Rs.20. If only the market price of the equity shares is > 20, conversion will be effected. The market value of the convertible bond does not affect the conversion will be effected. The market value of the convertible bond does not

effect. the conversion will be affected. The market value of the convertible bond does not affect the conversion price or conversion ratio. The conversion ratio will be set. such that. it is not lucrative to convert immediately. Say the current price of the share is Rs.22. Then the conversion value of the bond at this point of time is 3 x 22 = Rs. 66. Say the bond goes at Rs.70 in the market. Then, the conversion premium is said to be Rs. 4 (ie.. Rs.70 – Rs.66). As long as conversion premium exists. conversion will not take place. To force conversion. the company may exercise call provision and call the bonds for redemption. say at its face value of Rs.60. The holders of the convertible bond will go for conversion as that gives Rs.6 more than call route redemption.

RIGHTS ISSUE

Rights issue gives the existing shareholders the right to subscribe to fresh issues of shares by the company on a priority basis. Hence this is an investment opportunity. How many rights are needed to get one fresh share will be determined by the company itself. You have to exchange the rights and pay the price for the share to get the share. Usually a lower price is fixed and hence the "rights" get value and can be separately sold.

The theoretical value of a "right" = $$\frac{P_0 - S}{N + 1}$$

Where "P_0" is the current price of the share. "S" is the subscription price of the share and "N" is the number of rights to be exchanged to get a rights share (For every share already held, one "right" is given).

Say a company issues 1 to 4 rights offer, at a price of Rs.80, while the current price per share is Rs.100. So far every 4 shares held, one rights share is issued. So, four rights, @ one for each of 4 shares held; are needed to buy a rights share. Then, the value of a right = (100 – 80) / 4 + 1 = Rs.4. If a right is available for price less than the above theoretical price, it can be bought. Suppose the rights are going at Rs.3.5 per right. To buy 4 rights needed to buy a rights share, Rs.14 needed. With 4 rights so bought and Rs.80 paid to the company, you can get a share at an overall cost of Rs.14 + 80 = Rs.94, which is still less than the market price of the share, viz Rs.100. But after rights issue market price will go down to Rs.96 or

$$\frac{(4 \times 100 + 1 \times 80)}{5}$$

Hence, the case of "rights" as investment avenues. As the value of "right" is derived from the current price of the share and the rights route subscription price, "rights" are called derivatives.

Summary

This lesson has briefly described the different avenues of financial investment both traditional and modern. They are broadly grouped in to fixed income type and varying income type. Fixed income group avenues are generally preferred by Risk-averse investors. Varied income types are called as derivatives. There are different types of derivatives namely options, futures, warrants, rights, and convertible etc. are available. These avenues help the investors to choose the particular avenue so as to cater his motives or preference.

Questions

1. Give an account of the features of fixed income securities
2. Explain the various forms of fixed income securities available for domestic investors.
3. How do bonds and debentures compare with other forms of fixed income investments
4. What are the fixed income securities available for overseas investors
5. Explain the features of debt market.
6. What are the features and varieties of varying income securities
7. Between fixed and varying income securities, which will you prefer? why?
8. Explain options as derivatives.
9. Describe features of futures and their uses.
10. What are warrants? Explain their investment significance

LESSON – 3

INVESTMENT ANALYSIS

Investment analysis refers to assessment of investment properties of a security. Returns, liquidity, safety, taxability, capital appreciation, participation in future prospects, transferability, risk and so on are parameters for assessment of securities.

Aspects of Analysis

Liquidity refers to easy salability without loss of time and value. Equity scrips generally have higher liquidity than debt securities. Even among equity securities, scrips of companies with growth prospects, track record, brand strength and the like have more liquidity. For shares of small companies liquidity is created by the OTCEI. For debt security, the NSE tries to create liquidity. Scrips which are listed in several stock exchanges have more liquidity. Non-security investments generally lack liquidity. Either time or event based maturity of scrip is normally the case.

Safety of principal is another parameter. Most non-security investments and debt securities have safety of capital. In other words, equity shares, convertible bonds and mutual funds might lack safety in depressed market. Choice of fund and concern is very crucial here to ensure safety of capital.

Equity and convertible securities have **appreciation prospects**. Growth firms, technologically sound concerns, competitively strong concerns, etc. have good appreciation prospects. Bonus issues and rights issues at reasonably reduced prices enable equity security holders realise capital appreciation.

Taxability of returns and tax rebate on investments are to be considered. The capital appreciation of NSC is not taxable but capital appreciation of mutual funds is taxed. Current returns are taxed after a basic exemption of Rs.13000. Capital gain is taxed, after adjustment for inflation, at a flat rate of 20%. Where tax rebate is provided on investment made. returns must be computed on net investment made. The implication of tax on investment vary with investment alternatives, nature and scale of return, the tax bracket of the investors, and so on.

Transferability, procedures thereto. stamp duty thereon. time taken to effect transfer, possibility of bad deliveries and related hassles have also significant implication on desirability of an investment.

Risk and return are the ultimate parameters. All factors referred to above find expression in return – its size and stability. Future prospects of return and stability of the same influence value.

Price and value are decision inputs. If price is higher than value a disinvestment decision is made and vice versa. Thus security evaluation is establishing the value of the security. relating the same with the market price and provide a comparative picture so that investment decisions can be effected.

Nature of Investment Analysis

Investment analysis is an analytic-synthetic task.. Several factors that have a bearing on security value need to be analysed. Everything should be synthesised into return. The two aspects of return – size and stability / volatality again synthesised into value. Similarly factors influencing price – the

demand and supply, the investment and speculation components, relation with the stock indices, sensitivity to market, etc., need to be analysed and synthesized into expected price. Then price-value pattern need to be established. In some cases price is closely reflecting value and in others there is wide variation. Timing of 'buy' and 'sell' should be decided on the basis of price-value gaps.

Investment analysis is a scientific process. Varied factors need to be inducted and several factors need to be deducted. Though scientific, huerism, rule of thumb and intuition are used in security evaluation.

Several disciplines like accounting, statistics, quantitative methods, mathematical modelling, probability theory etc. are used in security evaluation. Today computer modelling is used to forecast price and compute value. Security analysis and investment research have become a discipline themselves.

Risk-Return trade off

Risk is the volatility of return. Return is the size of reward. Generally risk and return in the same direction. High return and high risk, low return and low risk and like relationship is more normal in the long run. So, if one wants to earn more return one has to pay a price for it in the form of risk. So, risk-return trade off means the 'price' in the form of risk one pays to benefit in the form of a higher return.

Return on an equity security has three components, viz. risk-free return, business risk premium and financial risk premium. The first component is what one gets from an investment in risk-free government security. It is reward for

parting with own money for a time period. It is return for waiting. The second component is benefit for taking risk of putting money in the scrips of a business concern as against a risk-free investment, say IVP or bank deposit. The third component is the return for investing in equity securities as against debt securities. The former come next to the latter in the matter of settlement of claims. Thus $E_{q(b)} = R_f + R_{p(b)} + R_{p(F)}$ Where $E_{q(r)}$ is return on equity, R_f is risk free return, $R_{p(b)}$ is premium for business risk and $R_{p(F)}$ if premium for financial risk. So, higher return goes with higher risk. If one is prepared to assume only lower risk, he should be satisfied with less return. Thus, an exchange between risk and return is established. This is risk-return trade off. The price of one unit of risk is established in the case of individual security by: (R_m-R_f) / variance of market return, where R_m is return on market portfolio and R_f is risk free return. The price when multiplied by the amount of risk, ie., covariance of return of the security and that of the market portfolio (which is the quantum of risk of the security) we get risk premium. As covariance rises, risk increases and that more premium return is expected. Lower the covariance, lower premium is expected. This is applicable in the context of portfolio also. A portfolio with higher risk coefficient should yield higher return and vice versa. Hence the exchange between risk and return. Hence the risk-return trade off.

Return Concepts

Return is the benefit or reward obtained from an asset or investment. Security return and portfolio return are two important concepts. Security return refers to return from a particular security (ie., bond, share, deposit, etc.). Security return can be current return or yield, actual return or yield, yield – to – maturity, earnings yield and so on.

Portfolio return is return from a group of securities. It is aggregate average return. All these are dealt below.

Security Return

First what is security return? Return means income or gain. Current income capital gain. tax shield, right to subscribe to future issues, preferential allotment in future issues, etc are all returns. The tax shield, rights and preferential allotment, etc. generally get reflected in the price of the security and that capital gain is inclusive of all these. So, current income and capital gain are the principal types of return of a security. In the case of shares, debentures, bonds, etc. Which are referred to financial assets / investments, the futures returns, their size and variability, are important factors influencing investment decisions. Measurement of return is an important task. Table 3.1 gives some common measures of return for equity and debt securities.

Table 3.1 Return on different types of securities

Security	Current yield or Estimated yield	Actual yield or realised yield
1. Debentures / bonds	= Expected interest/ Actual price of share	= Interest received / Actual purchase price

There is another more versatile, measure of return, known as 'holding period yield'. (HPY). This measure is useful for all classes of assets / investments. The formula is:

$$HPY = \frac{\text{Income received during year or period t} + \text{Change in price during year or period t}}{\text{Price at the beginning of year or period t}}$$

On a security bought at Rs.195, two times returns received, viz Rs.25 and 35. Now the price is 215. The holding period return =

$$\frac{35 + 35 + (215 - 190)}{190} \times 100 = 50\%$$

Let us compute the return for some securities now. An investor buys a 17% bond of Rs.1000 face value, with 10 year maturity, at Rs.850. Calculate current yield and yield to maturity.

$$\text{Current yield} = \frac{\text{Expected coupon interest}}{\text{Current market price}} \times 100$$

$$= \frac{\text{170 or 17\% on 1000}}{850} \times 100$$

$$\text{yield to maturity} = \frac{\text{Average annual return}}{\text{Average investment}}$$

$$\text{Average Annual bond Return} = \text{Expected annual interest on the} + \frac{\text{Maturity value} - \text{Current value}}{\text{Period to maturity}}$$

$$= 170 + \frac{1000 - 850}{10} = 185$$

Average investment = (current price + maturity value) / 2

= (850 + 1000) / 2 = 925

$$\text{Now, yield to Maturity (YIM)} = \frac{\text{Annual average return}}{\text{Average investment}} = \frac{185}{925}$$

= 0.2 or 20%

In the case of redeemable securities the YTM is generally calculated. The above formula can be applied to calculate the return on redeemable preference shares also. For non-redeemable securities – like equity shares, irredeemable debentures and preference shares YTM cannot be calculated. There the Holding Period Yield (HPY) is appropriate.

An investor has bought an equity share a year ago at Rs.85. He has just received a dividend of Rs.20 on the share and now the ex-dividend price of the share is Rs.105. Calculate actual yield and HPY.

$$\text{Actual dividend yield} = \frac{\text{Dividend received}}{\text{Purchase price}} \times 100$$

$$= \frac{20}{85} \times 100 = 23.53\%$$

$$\text{HPY} = \frac{\text{Dividend received + Change (increase) in price}}{\text{Price at the beginning}}$$

$$= \frac{20 + (105 - 85)}{85} = \frac{40}{85} = 0.47 = 47\%$$

Expected return based on profitability distribution

Suppose the return in a security has the following profitability distribution 10% with P = 3: 15% with P = 5 and 20% With P = .3. Then expected return = Summation R_1P_1 = 10% x .3 +15% x .4 +20% x .3 = 3% + 6% + 6% = 15%.

In the case of equity shares, earnings yield, another measure of return is also used. It is simply, the earnings per share (ie. earnings after interest, tax and preference dividend / outstanding shares) divided by the current price. Say the EPS for a company's share is Rs.4 and its current market price is Rs.36. The earnings yield = 4/36 = 11 = 11%. The inverse of earnings yield is popularly known as P/E ratio. It is here 36/4 = 9. P/E ratio indicates show how a

security's price is related to its earnings. To sell or buy a security is well planned with P/E ratio. A security with high P/W ratio may be said as it is highly priced now, and at any time its price might come down. A security with low P/W is relatively underpriced, it is better to paput your money in it, as its price might move up shortly and you get a capital gain. Hence, the use of earnings yield and its inverse, the P/E ratio. But P/E ratio has limitations. Other factors must be considered.

Computation of return from daily quotes

Return can also calculated from daily price quotations.

Risk can also be measured using daily-price-based daily return. Say during the last 11 trading days a security had quoted daily beginning of session as follows:

48, 50, 47, 50, 51, 55, 49, 50, 48, 50 and 55

Then for Day for 2 = $\frac{50-48}{48} \times 100 = 4.17\%$

Day 3 = $\frac{47-50}{47} \times 100 = -6.00\%$

Day 4 = $\frac{50-47}{47} \times 100 = 6.38\%$

$$\text{Day 5} = \frac{51 - 50}{50} \times 100 = 2.00\%$$

$$\text{Day 6} = \frac{55 - 51}{51} \times 100 = 7.84\%$$

Similarly for Day 7, Day 8, Day 9, Day 10 and Day 11, the returns work out to –10.9%, 2.04%, -4%, 4.21% and 10% respectively.

The daily average return for the 10 day period works out to 1.574%.

Portfolio Return

Now, we are coming to discuss the portfolio return. Portfolio means a collection of investment. Say, you invest a sum of Rs.10,000 in company X convertible debentures, Rs.8,000 in company Y debentures Rs.5,000 in open-end mutual fund, Rs.5,000 in close-end and mutual fund 1992, Rs.10,000 in Company A shares, Rs.18,000 in Company B shares, Rs.25,000 in company C shares in Rs.19,000 in Company D shares. So, your portfolio consists of these 8 securities, if available, the portfolio return can be calculated. Simply you add the return from each of these 8 investments and divide the same by the total amount of investment in all these securities, viz. Rs.1,00,000. You get the portfolio return.

Portfolio Return = R_p = Summation W_i R_i

Where.

W_i = Wt. of the i^{th} security

and R_i = return of the i^{th} security of the portfolio.

$$Wt = \frac{\text{Amount invested in a particular security}}{\text{Total investment in all securities}}$$

In the case of your portfolio the weights are: 0.01, 0.08, 0.05, 0.1, 0.18, 0.25 and 0.19. Say the hypothetical returns for these different investments are, 30%, 28%, 25%, 28%, 31%, 32%, 40% and 35%.

Then R_p = .01 x 30% + .08 x 28% + 1 x 31% +
18 x 32% + .25 x 40% + .19 x 35%

= 3 + 2.24 + 1.25 + 1.4 + 3.1 + 5.76 + 10 + 6.65
= 33.4%

RISK ANALYSIS

Risk is variability or volatility in anything. In investment analysis. Risk is the variability in return. Risk simply measures the fluctuations in return. High fluctuations means higher risk and vice versa. Industrial securities have their own risk levels and portfolios of securities have also risk.

Types Of Risk

There are several risk components and types. Besides, risk complexion of individual investment differs from that of a portfolio, which is nothing but a basket of investments. All these aspects are presented below.

Diversifiable Vs Undiversifiable Risk:

Diversifiable risk is also known as unsystematic risk and it stems form factor specific to particular firms or industries. Difficulty in entering certain markets, plant break down, strife in relationship between management and employees etc. are some firm / industry-specific factor causing risk. Undiversifiable risk is that which cannot be reduced even with diversification. Undiversifiable risk affects uniformly all inaustries, all firms and all investment avenues. The risk is also known as systematic risk and stems from macro-level factors like inflation, political factors, internal peace and stability of economic systems adopted, public spending etc. Of course, these factors affect all firms, though not uniformly. The systematic risk is borne by all investors, while shrewd investor avoid unsystematic risk by planned diversification.

The Different risk can be further classified as:

Interest rate risk,	Callability risk,
Convertibility risk,	Default risk,
Management risk,	Liquidity risk,
Market risk,	Purchasing power risk,
Political risk and	Exchange rate risk.

Each type of risk has Diversifiable and undiversiable component. All risks when aggregated. we get the total risk of an investment security. Diversifiable risk is that part of total risk which can 'e .educed (investors prefer to reduce risk) by investing in a plural number of securities. Assume that company A's share yields good returns when there is a good monsoon and B's share yields well when there is a drought when one invests one's fund in part in both the shares. whether or not there is good monsoon or a drought. one is sure of a moderate. stable return. But. when one puts ail fund in either A or B. one's returns will fluctuate. Don't pull all eggs in one basket thus. is the logic.

Security Risk Vs Portfolio Risk

So far the discussion centred on the types and components of risk. No the risk of an individual investment security and that of a portfolio are deal with. Individual securities always have both the diversifiable and undiversifiable risk components. A portfolio is a basket of investments. wherein the attempt is to reduce the diversifiable risk to the minimum. True with less risk the overall return earned is also a bit lower. less risk. less return is the rule of the game. Of course. the diversifiable risk remains the same for a single as well as for a well diversified portfolio of securities.

The Question is why the diversifiable risk component of a portfolio is generally less than that of an individual security? The portfolio risk is influenced by three factors. viz. the proportion of individual securities in the portfolio, the standard deviation of return of individual securities and the correlation coefficient between the returns of pairs of individual securities. Of these. the correlation coefficient is a very crucial factor. It tells the direction of movement of the returns of pairs of individual securities. When the returns

move in the same direction, the correlation is +ve, portfolio risk increased. When the returns in the opposite direction, the correlation is –ve. Portfolio risk is decreased. If it is equal to one – the maximum possible, the portfolio risk is maximised and if the correlation is zero, the risk is moderate.

It is this relationship between portfolio risk and correlation coefficient of the pairs of securities if the portfolio, that was brought to light by the Noble Prize Winner prof. Harry Markowitz . in a multi-security portfolio. when several pairs of securities have negative or near negative correlation coefficients, the portfolio risk would be lower and vice versa. So not all diversification reduces risk. Only Markowitz Type diversification, with many pairs of securities with low or negative correlation coefficients or returns, reduce the portfolio risk.

Beyond a certain level of diversification, further addition of securities to the portfolio does not reduce risk anymore. At this stage the portfolio is sufficiently diversified with portfolio risk equal to market systematic risk or undiversifiable risk. About 20 securities would sufficient to build a balanced portfolio, it is said.

Components Of Risk

There are several components of risk. These are dealt below.

Interest Rate Risk

Interest rate risk arises due to fluctuation in market interest rate. Consequent to change in market interest rate, the potential return from a

security fluctuates. Debenture interest rate in India was recently unfreezed. It is possible that the coupon rate on a debenture/bond is more or less than the market sentiment. Now the interest on risk free government bonds is high. All market rates get adjusted upwards accordingly. The coupon rate on bonds issued earlier is, therefore at variance with the present market interest rate. This variation is denoted as risk in the parlance of investment management. Interest rate change affects not only bondholders but also equity security earlier borrowings change affects not only bondholders but also equity security earlier borrowings change and consequently equity earnings also change. So, return on equity varies whenever market interest rate and coupon rate on bonds are at variance. Hence the significance of interest rate risk for all classes of investors.

Interest rate risk can be segregated into diversifiable and diversifiable components. The diversifiable interest rate risk is specific to some firms. A firm that is teetering on the verge of a financial collapse cannot raise funds at market rate of returns. Investors who have included the particular firm's securities in their portfolio would experience fluctuations in the portfolio return. They can, however reduce the risk or their portfolio by diversifying, i.e., skipping the firm and investing in other firms. Earlier it is done, the better. By investing in bonds with different credit ratings this risk can be reduced.

Undiversifiable interest rate risk cannot be reduced even with diversifications. This results when there is a wholesale change in the market rates in the economy. Say at a particular time the demand for 'AAA' grade bonds (blue-chip bonds with lowest coupon rates) has outstripped the supply. Taking advantage of the upbeat sentiments bond issuers would further reduce interest rate. Consequently part of the demand for 'AAA' grade bonds. gets

diverted to 'AA' grade (High quality but not blue-chip with slightly higher coupon rate than 'AAA' grade) pushing up the demand for 'AA' grade.

This results in decrease in the interest rate on 'AA' bonds. Like a wave-wise pattern, there is an all round drop in interest rate. A reverse trend can also happen any time. These wholesale shifts in interest rates affect returns made by investors, whether or not they change their portfolios. They are helpless and cannot reduce the variability in return due to the market – wide change in interest rates.

Callability Risk

Debt securities and preferred stock may be called for redemption at a specified time, anytime during a certain period or any time at will of the issuers, in whole or part. When part redemption is effected, the company may adopt lottery method to pick up the distinctive bonds/stocks for redemption. Such calability is an intrusion in the investors portfolios. Suddenly they are left with liquidity which they have to deploy effectively which would involve some time and cost. Hence their earnings are affected and this variability in return is referred to as calability risk.

Callability risk may be diversifiable or otherwise. When only few firms exercise the convertibility provision as per the terms of issue, the investor concern can diversify away the Callability risk by avoiding scrips with Callability provisions. On the contrary, due to general decline in interest rate, if all firms exercise Callability provision to retire higher coupon bonds with lower coupon bonds, the risk cannot be reduced through diversification. Variability in return on portfolio is happening across the board.

Convertibility Risk

In theory. companies whose equity stock price is some. what depressed at the moment. go for issuing convertible securities and later exercise conversions when equity price has turned favourably. Until recently, there was a growing equity – cult in Indian capital market. The convertible issues were overwhelmingly received as the allottees. would get equity stock. And what is the risk involved here when the investors are particularly happy with the convertible securities? One need to remember that risk means variability in return. And when conversion is effected, the pattern and scale of return varies. Temporarily even equity returns might dip. Hitherto, on the convertible security a steady and periodic return was obtained.

On conversion into equity. return will fluctuate. Hence the conversion risk. The timing of conversion. conversion ratio and pattern of return on converted securities. etc., affect the complexion of convertibility risk. Convertibility risk is generally diversifiable as variety in conversion is generally the rule. If all firms have uniform conversion terms, perhaps an element of systematic (i.e undiversifiable) risk emerges. But such uniformity is a rarity.

Default Risk

This is by far the most important of all risks. When a firm defaults in payment of contractual payments like interest on debt securities and/or repayment of principal, default risk haunts the investments. When a firm defaults interest payment. return on equity and preferred stock would also. be

thrown to a fluctuating fate due to stock market reactions. Default risk is somewhat tied up with highly levered capital structure. In lean years of profit, debt servicing becomes under heavy strain. Since the high leverage is an important cause, default risk is also come to be known as financial risk, risk arising due to methods of financing adopted. Default risk is not something sudden, except when "acts of god" destroy the fortunes and property of a concern. That is, default risk can be foreseen in normal situation using several financial forecasting, and analytical tools. It is with the help of these tools, bonds are classified by credit rating institutions like GRISIL, ICRA, Standard and Poor's etc. High grade bonds are given 'AAA or AA, the medium grade 'A' or BBB, and speculative grades are given BB or B. Default grade bonds are given C,D, etc. in the order from bad to the worst.

Let us come to the diversifiable and undiversifiable components of default risk. A recession, a credit squeeze, like interest rate etc. would push down the marginal firms into chaos adding more number of firms in the default category. Even firmly established concerns might find the going difficult. Say, 10% of firms are normally accorded the default grade. This is unsystematic or diversifiable. One can avoid them say, in a particular year due to monetary stringency additional 10% of firms are thrown into financial disaster and the "grades" of the other firms are also rated lower. This is the undiversifiable default risk as financial stringency affects whole of trade and business. Variation in returns of even well diversified portfolios is experienced if tight monetary policy is adopted.

Management Risk

Variation in return on investments caused by management decisions is called management risk. In the choice of firms for investment, investors keenly consider the quality of management of the firms. Management with proven record, promoters with clean tract, visionary and missionary management are favoured by investors. Good management's even insure against "Acts of God" it is said. All said and done, 100% insulation from bad decisions of management is not possible. Management is capable of mismanagement. Management risk as a component of total risk of an investment is always present. Regarding management errors, we need not elaborate. They are infinite and as varied as fingerprints and cornflakes.

Managers are 'agents' of the equity stakeholders. Agents actions need not always be optimal and in the interest of providers of capital to the firm. The divorce between ownership and management is cause contributing to fluctuations in returns on investments. Managers have to complete with both within and outside and their performance is market- tested. They gain, if their performance is rate well, by career advancements. So, they always strive for optimal performance even though they are only agents. Let us forget the difference if any between owner – managers and employee-managers at the moment. Basically, both are human and as mortals they incidentally make wrong judgements, for which investors pay. Hence the management risk. Most mutual funds in India are at present sub-optimally performing. The fund managers are squarely responsible for this. The systematic component for management risk is caused by the uncertain business environment in which every manager is operating. The unsystematic component is accounted by the firm specific management weakness.

Market Risk

Market risk is defined by Jack Clark Francis as "that portion of an investment's total variability of return that is caused by the bull and bear market conditions." Persistent upward move in stock price index is called as a 'bull market' the opposite situation is know as bear market. Bull and bear markets alternate in stock exchange and security prices fluctuate, for an apparent fundamental change in the intrinsic merits of the securities, but purely due to variations is demand and supply factory caused by bullish/bearish trend in the stock market. The BSE SENSEX role to dizzy height of over 4630 points by Sep'1994. If fell down later to less than 3000 points in May 1995 and then recovered to 3350 points by mid June 1995. And now in March 1998 it is still around 3650 points only. Bull and bear phases are thus the order.

Market risk is also divisible into diversifiable undiversifiable. Diversifiable market risk is said to prevail when a minority of securities remain stable or move in opposite direction to the market trend. In a bulish market, these securities either do not appreciate or do suffer downslide and vice versa. This happens because of exclusive factors affecting the firms concerned. On the contrary, undiverisifiable market risk arises due to a combination of market –wide systematic factors. We can quote the downswing in stock market in India that followed the unearthing of the scan as systematic risk.

Liquidity Risk

Liquid investments are those that can be realised in cash with no loss of time and value. Liquidity means either a time loss or value loss or both in realisation. Liquidity risk therefore refers to variability in return due to illiquid features of an investment. In its realisation one has to pay additional commission offer more discount, and or wait for sometime. Listed securities have less liquidity risk than unlisted; equity securities have lesser liquidity risk than debt securities; junk bonds, have higher liquidity risk than default grade bonds and so on.

Purchasing Power Risk

A good investment should provide periodic return and appreciate in real terms rather than in nominal money terms, so that the investor is protected against erosion in the real value of investment. Due to money illusion, that is overt concern for quantity of money rather than for its quality -ie., the purchasing power, many of us are putting our hand earned funds in investment which hardly earn anything in real terms. This is the fate of debt securities. The Investment is not hedged against inflation and the investor suffers loss in real terms. The consequent fluctuation in return is called purchasing power risk. A portfolio that consists only of fixed return bearing securities has a high degree power risk during inflation. Diversification by including equity investments and other securities with growth potential is the only way of diversifying the risk. Diversification is not, therefore, a number game. It is one of character, the portfolio complexion has to be changed. But the ever-present inflation, however of a small degree, is causing value dilution uniformly leading to undiversifiable risk.

Political Risk

Variability in return caused by the exploitation of the politically weak group by politically strong, either through economic or political means for pursuing economic or political interest of the later, is known as political risk. Political risk can be national or international. National political risk takes the from of political decisions affecting whole or part of businesses. The licensing system had its sway in India business till recently. Select business is taxed more while others are lived less. The investors can diversify away the political risk by picking up industries towards whom the Government policies are favourable. But certain measures of the Government, like risk in fiscal deficits, monetary stringency, compulsory schemes of labour participation in management, liberalisation, exit policy, etc. affect all business. This is undiversifiable . International political risk can be seen in two forms. International political factors affecting domestic business interest and domestic legislations affecting international business operating in the country vis-à-vis domestic businesses. When USA confers the most favoured nation status to a country, that country's business benefit. At the same time when special 301 is used to retaliate against a country that country's business are affected. The effect is the investors experience dispersion in their earnings. Similarly, schemes of economic liberalisation influence non-residents investment options and return on their investments. Hence, the international political risk.

Exchange Rate Risk

Last, when transnational investment are held or when business are, conducted internationally, exchange rate risk takes place. Exchange rate variations are commonplace. A havala rate, a market rate, an official rate, and

other ramifications are there. These rates themselves are volatile causing variation in returns. Hence, the exchange rate risk. Developing countries import more. Their exports are lower. Hence the exchange values of their currencies are continually depressing. So import intensive business are affected much. Export intensive business gain. But in transnational business uncertainty in more. So; exchange rate risk is there for both export intensive and import intensive business.

Measures Of Risk

Risk is the variability in return. So any measure of variability can be a measure or risk. In statistics we study range, quartile deviation, mean deviation, standard deviation, etc. which are measures of variability or dispersion. When we compute these measures with respect to the return of a security, we get the risk of the security. Say the return on security, Y for the past 10 years are.

12%, 18%, 13%, 22%, 8%, 5%, 40%, 18%, 20%, and 24%

Range = Highest value - Lowest value = 40%-5%=35%

Quartile deviation=3rd quartile-1st quartile=22%-12%=10%

Mean deviation = sum R – R Where the sign '||' is read modulus, which means

All values are considered positive, irrespective

n of sign.

$$= \frac{74}{10} = 7.4\%$$

The most appropriate measure of risk of a security is the standard deviation of its returns. The formula is:

$$S.D. = s = \left[\text{Summ } (R_I - R)^2/n \right]^{0.5}$$

We may calculate the same here. R = Mean = 18%

R_i	$R_i = R$	$(R_I-R)^2$
12.	-6	36
18	0	0
13.	-5	25
22	4	16
8	-10	100
5	-13	169
40	22	484
18	0	0
20	2	4
24	6	36

Summ $(R_i - R)^2 = 870$.

+-　　　-+0.5

$$S.D = \text{summ} \quad (R_1 - R)^2 \quad = \frac{870}{10}$$

$= 9.32\%$

+-　　　-+

Risk can also be measured using daily-price-based daily return. Say during the last 11 trading days a security had quoted daily beginning of session as follows:

48, 50, 75, 50, 51, 55, 49, 50, 48, 50 and 55

$$\text{Then return for Day 2} = \frac{50 - 48}{48} * 100 = 4.17\%$$

$$\text{Day 3} = \frac{47 - 50}{50} * 100 = -6.00\%$$

$$\text{Day 4} = \frac{50 - 47}{50} * 100 = 6.38\%$$

$$\text{Day 5} = \frac{51 - 50}{50} * 100 = 2.00\%$$

$$\text{Day 6} = \frac{55 - 51}{51} * 100 = 7.84\%$$

Similarly for Day 7. Day 8. Day 9. Day10 and Day11, the returns work out to – 10.9%, 2.04%, -4%, 4.21% and 10% respectively. Similarly daily return on a stock exchange with respect to a particular index can be calculated taking the closing index of figures as follows.

$$\text{Today's Return} = \frac{\text{Today's Index} - \text{Yesterday's Index}}{\text{Yesterday's Index}}$$

The Daily average return for the 10 days period works out to 1.57%. And the std. deviation comes to: 6.595%. Std. deviation divided by mean return is called coefficient of variation. Which is a relative measure of risk per unit return.

Beta Coefficient

Risk can be computed using beta coefficient. We need to be given security return and market returns. Annual figures for several years or daily figures for several days may be given. Market return is based on share price-index of a representative type. We can use BSE sensex daily close index value and get daily return. From this, annual return can be derived using arithmetic average of daily return or suing geometric mean. Let us take that we are given

the annual returns on Security. A and the market, which are as follows for 10 years.

$\bar{R}_A$	$\bar{R}_M$	$R_A - \bar{R}_A$	$R_M - \bar{R}_M$	$(R_M - \bar{R}_M)^2$	$(R_A - R_A)(R_M - R_M)$
14	11	-2	-2	4	4
18	15	2	2	4	4
17	14	1	1	1	1
-2	-4	-18	-17	289	306
17	13	1	0	0	0
19	14	3	1	1	3
20	19	4	6	36	24
25	22	9	9	81	81
15	12	-1	-1	1	1
17	14	1	1	1	1
160	130	0	0	418	42

$$\text{Beta} = \frac{\text{Sum: } (R_A - \bar{R}_A)\ (R_M - \bar{R}_M)}{\text{Sum: } (R_M - R_M)^2}$$

Beta is nothing but ration of covariance of returns of the concerned investment and the market to the variance of the market returns.

The resulting figures is just a number. Experts say bata coefficients ranges between – 3 and +3. If it is 1, it means the investment is as risky as the market and moves in the same direction: If it is-1, the investment is as risky as

the market. but moves in the opposite direction to the market. If the market return rises by 2% then, the security return falls by 2%. If the beta is 2, when market return goes down by 2%, the security's return goes down by twice the figures, ie, 4%. If the beta is-2, the security's return is twice volatile as that of the market return but they move in opposite direction. That is if the market's return moves up by 3% the security's return moves down by 6% and vice versa.

The risk of a security consists of two components, viz., systematic risk and non-systematic risk. Systematic risk, otherwise called as undiversifiable risk, arises due to fluctuations in general economic conditions, in people preferences, political factors, etc. These affect all industries, and all securities. Non –systematic risk is specific to a particular firm, security or industry. The fluctuations in the sales, in management skills, in productivity and the like of a particular firm affect the return on the equity of that firm. The return fluctuates, resulting in risk. This risk is called non-systematic risk of the different securities get mutually offset or adjusted to some extent, reducing the risk of the portfolio. In other words, the portfolio would still have some of the un-off-set non-systematic risk and the systematic risk. A well diversified portfolio reduces unsystematic risk to zero and has only systematic risk.

How do you measure risk of a portfolio? You have to note that portfolio risk is a function of : W – relative proportion of the securities in the portfolio, S=std deviation of return or the risk of individual securities in the portfolio and r= correlation of returns of pairs of securities. The popular measures of portfolio risk is standard deviation of portfolio return.

And the formula is: S=(Summ.summ W W r S.S)

Where,

W = Weight of the with security

W = Weight of the jth security

R = Correlation coefficient of the returns of ith and jth securities.

S = Standard deviation of return of ith security and

S = Std. deviation of return of jth security.

Let us take an example. A and B are the two investment securities you have Rs.60,000 is invested in A and Rs.40000 is invested in B. The standard deviation of A and B are 5% and 8%.

The correlation coefficient is 0.8. what is the level of portfolio risk?

W = 60000 / 100000 = 6; W = 40000 / 100000 = 4

S = (Summ.Summ W W r S S)

=Square root of (.6* .6* 1*5* 5 + .6* .4* .8* 5* 8 + 4.4* 1* 8* 8+4* 6* 8 8* 5)

=Square root of (9+7.68 +10.24 + 7.68)

= 5.882

The portfolio risk will be more if there is highly positive, moderate when r = 0 and low when r is highly negative. The portfolio risk will be more if their varies between +1. In the above problem their and r are taken as equal to one. These are self-correlation coefficients which are always 1.

Let us take in the above example r = 1. Then,

S = Square root of (.6* .6* 1* 5* 5* 6* 4* 1* 5* 8 + 4* 4* 1* 8* 8 + 4* 4* 1* 8* 8 + 4* 6* 1* 8* 5)

= 6.2%

Let us take the r = 0. Then,

S = (6* 6* 1* 5* 5 + 0 + .4 * .4 * 1 * 8 * 8 + 0)

= (9 + 10.24) = (19.24) = 4.5

Let us take r = -1,then

S = (9- 9.6 + 10.24 -9.6) = .2

You now understand that when r >0 risk is high, r =0 risk moderate and when r <0 risk is very low. So, while constructing portfolios, you have to give priority for securities which have negative correlation or low positive in many pairs of securities. This is more so in planned economies.

Take another example. There are three securities in a portfolio: 1,2 and 3. Their individual standard deviation of return is : 5%. 7% and 8%. The proportion of investment is 40. and 30%.

The $r_{1.2}$ = .8, $r_{2.3}$ = .5 and $r_{2.3}$ = .1.

Calculate S_P

When we have more than 2 securities in a portfolio, we can adopt a different computation method for finding S_P. This is explained below

Note $r_{1,3} = r_{3,1}$; $r_{2,3} = r_{3,2}$ and so on.

Table = 1: The model

	S_1	S_2	S_3
S_1	$r_{1,1}$	$r_{1,2}$	$r_{1,3}$
S_2	$r_{2,1}$	$r_{2,2}$	$r_{2,3}$
S_3	$r_{3,1}$	$r_{3,2}$	$r_{3,3}$

Table = 1: with figures

	S_1 =5,	S_2=7	S_3=8
S_1=5	1	.8	.5
S_2=7	.8	1	-1
S_3=8	.5	-1	1

Table = 2: The model

	W_1	W_2	W_3
W_1	$C_{1,1}$	$C_{1,2}$	$C_{1,3}$
W_2	$C_{2,1}$	$C_{2,2}$	$C_{2,3}$
W_3	$C_{3,1}$	$C_{3,2}$	$C_{3,3}$

Table = 2 with figures

	W_1 =.4	W_2=.3	W
W_1=.4	25 (4)	28 (3.36)	20 (2.[illegible])
W_2=.3	28 (3.36)	49 (4.41)	-5.[illegible] (-.50[illegible])
W_3=.3	20 (2.4)	-5.6 (-504)	64 (5.76)

$C_{1,1} =$ $S_1 * S_1 * r_{1,1}$ $= 5 * 5 * 1 = 25$

$C_{2,1} =$ $S_2 * S_1 * r_{2,1}$ $= 7 * 5 * 8 = 28$ and so on.

From table –2, we calculate W_i, W_j, $W_{i,j}$

$W_1 W_1 C_{1,1} = .4 * .4 * 25 = 4$; $W_1 W_2 C_{1,2}$ $= .4 * .3 * 28 = 3.36$

$W_1 W_3 C_{1,3} = .4 * .3 * 20 = 2.4$; $W_2 W_1 C_{2,1}$ $= .3 * .4 * 28 = 3.36$

$W_2 W_2 C_{2,2} = .3 * .3 * 49 = 4.41$; $W_2 W_3 C_{2,3}$ $= .3 * .3 * -5.6 = -.504$

These figures are available in table-2 itself in brackets and can be done mentally.

So Summ. Summ W_i $W_j r_{i,j} = 24.682$

$S_p = (24.682)^{0.5} = 4.968$ or 5%

Risk describes the quality of return – its cerainty or otherwise. Given a time series data on the return of a security, its expected (i.e. mean) return and its risk can be computed. Risk is measured by the dispersion or variability in return from the mean or expected return. Generally, standard deviation of return on investment is taken as the measure of risk, though other measures of dispersion, like quartile deviation, mean deviation, range and coefficient of variation may also be used.

VALUATION ANALYSIS

Investors are much concerned with the value or worth of the investments they hold or intend to hold. If the value is greater than the price at which the investment is selling, then it is better the investment is held or ought. If value is less than the market price, better you sell off or don't buy the same. If value is equal to price, don't trade.

The Value (V) emanates from perceived risk and projected return of the investment. And price (P) cannot be much at variant with the value in an efficient market. If P < V, there will be buying pressure and price builds up to equal value. IFP > V, selling pressure leads to price pushed down to equal V. The above presentation is what is called as Cootner's Price – Valuation Interaction Model. It is, therefore, evident, price and value are related and investors are to be knowledgeable or value price relations.

Concepts Of Value

There are different concepts of value. Book value, market value or price, intrinsic value (or discounted present value or economic value), nominal value, real value, etc are certain concepts of value.

Book Value refers to the historical cost based value. Let us take the cost value less depreciation of fixed assets of a company as Rs.5 crs. And say the value of its current assets is Rs.4crs, making total book value of assets Rs.9 crs. Et the long term and current external liabilities be Rs.4.8 crs. So, net worth of the company is Rs. 4.2 crs (ie., 9-4.8). Assuming the number of outstanding shares (all equity) at 4,00,000 the book value per share comes to Rs.105. Book

value of shares of old companies might be lower than similarly placed, but new companies, because the latter's book prices are inflation-hit.

Market Value is the price. Or it can be taken differently. Compute the market value of all assets. Subtract market value of liabilities from the aggregate total market value of assets. The remaining market net worth when divided among number of outstanding shares you get market value or more appropriately market (imputed) value of a share, because it is not the traded value. So market value may refer to the traded and imputed market value.

Intrinsic Value or ***Economic Value or Discounted Present Value***, is very important measure of value. How does any thing gets value? From returns expected to be derived, any thing gets value. The returns may be monetary or otherwise. As to investments monetary returns are the seeds and soul of value of the same. Since returns are expected to be derived the period over which they are expected and the certainty with which these are expected to be received, besides the actual size of returns are important. The returns over entire period over which the scheme is expected must be covered. If certainty is more a less discount rate (because of lower risk) and if the same is low, higher discount rate are to be used. Net value varies inversely with the discount rate employed.

Suppose from an investment you are expecting a payment of Rs. 95, 5, 5, 5 and Rs.30 over 1st through 5th year, all receipts at year end. If we use a 20% discount rate, the present value of these future receipts is: $90/(1+20\%) + 5/(1+20\%)^2 + 5/(1+20\%)^3 + 5/(1+20\%)^4 + 30/(1+20\%)^5 = 90/(1.2) + 5/(1.2)^2 + 5/(1.2)^3 + 5/(1.2)^4 + 40/(1.2)^5 = 75 + 4.167 + 3.472 + 2.894 + 12.056 = 97.59$.

This is also known as intrinsic value economic value. If 10% discount rate is used instead, the PV will be higher at; $90(1.1) + 5/(1.1)^2 + 5/(1.1)^3 + 5/(1.1)^4 + 30/(1.1)^5 = 81.82 + 4.55 + 4.13 + 3.75 + 18.63 =$ Rs.112.88.

We can generalise tne valuation model as below. PV or IV or EV = Summation: $E_1/(1+r)^1$, Where E_1 is earnings flow over time, 't', r is the discounting rate and 't' is time measured normally in years varying from 1 to n. If different 'r' is to be used year after year, then the formula whill be: $E_t(1+r_1)^1$.

If a given earnings is to be perpetually received, at annual rests, the PV of that future scheme of income is given by: E/r, Where "E" the earnings and 'r' the discounting rate. Suppose as per terms of an insurance policy, the survivor of a joint policy is given annually Rs.10000 until he breaths his last. Assuming the survivor survives for a fairly long period and an interest rate of 12% (ie, the "r"), PV of the annuity is: Rs.83333 (or Rs. 10000/0.12). At r = 10%, the PV will be Rs.1,00,000.

If the future earnings is supposed to grow annually at, say, 5% or so, the present value of future earnings stream is given by: $E_1/r\text{-}g$. Where E_1 is expected earnings one year hence or next earnings amount, r-the discount rate and 'g' is annual growth rate in earnings. Suppose the insurance company agrees to pay 5% more every year over previous year. And if $E_1 = 10000$, th ePV = 10000 / (12% -5%) = 10000 / 0.07 = Rs.1,42,857.

Nominal Value is the money value at current money units or current costs. Suppose you deposited Rs.10000 on 1.1.95 for three years carrying 15% interest, interest compounded annually. So the maturity value on 1.1.98 is:

$10000\ (1_r)^3 = 10000\ (1+15\%)^3 = 10000(1.15)^3 = 15208.75$. So, Rs.15208.75 is the nominal value of your investment.

Real Value is the inflation / deflation adjusted nominal value. Assume in the three years, inflation averaged 6% p.a. Then the value of the Rs.15208.75 nominal sum is: $15208.75 / (1.06)^3 = \text{Rs.}12770$.

The investors real value is more important. If only investments return more than the rate of inflation, there will be real value addition.

Share Valuation

In this section valuation of shares is undertaken. First let us take valuation of preference shares. Next we shall see valuation of equity shares.

(a) Valuation of Preference Shares

In the case of irredeemable preference shares, the perpetuity model, viz, $V = E / r$, is to be adopted. Say an irredeemable preference share of face value of Rs.200 has a coupon rate of 14%. Let the expected rate of return be 12%, 14% and 16%. Then the PV of the pref. share at different "r" will be as follows:

When expected return = 12%, PV is Rs.28/0.12 = 233,
When expected return = 14%, PV is: Rs. 28/0.14 = 200
and When expected return = 16%, PV is: Rs. 28/0.16 = 175.

So, when expected return (ie., the risk adjusted return) is > coupon, value is less than face value, if it is = coupon, value is equal to face value and if it is < coupon rate, value is more than face value.

In the case of redeemable preference share, the $E/(1+r)^1$, model is to be used. Say, a pref share of face value Rs.500 and coupon 12%, is having 5 years to maturity. At maturity a maturity bonus of 5% is also promised. If the expected return is 10%, the PV is $60 / (1.1) + 60(1.1)^2 + 60(1.1)^3 + 60(1.1)^4 + (60+525) / (1.1)^5 = 553$. If the expected return is to be taken as 10%, 11%, 12%, 13% and 14% respectively for 1st through 5th year, the $E_1/(1+r_1)^2$ model be used. Then, $PV = 60/(1.1) + 60 / (1.11)^2 + 60 / (1.12)^3 + 60/(1.13^4 + 585 / (1.14)^5 = Rs.487$.

PV moves inversely with the maturity period, when r is equal to or greater than coupon. That is with less period to maturity PV rises and vice versa, when r is equal to or greater than coupon. Let us take two maturity periods viz 2 & 3 years, r = 12% and 13% coupon = 12%, maturity bonus = 5% and face value = Rs.500.

(i) r = 12%, n= 2yeaars

$PV = 60/1.12 + 585/(1.12)^2 = 519.93$

(ii) r = 12%, n = 3 years

$PV = 60/1.12 + 60/(1.12)^2\ 585/ (1.12)^3 == 517.79$

(See, as 'n' rises, PV falls)

(iii) $r = 13\%, n = 2$ years

$PV = 60/1.13 + 585/(1.12)^2 = 511.24$

(iv) $r = 13\%, n = 3$ years

$PV = 60/1.13 + 60/(1.13)^2\ 585/(1.13)^3 == 505.52$

(See, as 'n' rises, PV falls)

PV moves directly with maturity period, if 'r' is < coupon. Suppose we take r = 10% in our just above seen example, then, (i) when 'n' = 2 years, the

$PV = 60/(1.1) + 585/(1.1)^2 = 538.02$

when, n = 3years, the $PV = 60/(1.1)^2 + 585/(1.1)^3 = 543.65$

Suppose, you have bought a 5 years to maturity preference share, face value Rs.100 with a coupon of 12.5% p.a and a maturity bonus of 5%. The expected return is 15%. You invest all dividends at 15%. What will be right price to sell the share at the end of the 4th year and how much money will you have then?

To answer this we have to find the terminal value of dividends at the end of the 4th year PV of the share at the end of the 4th year.

Terminal Value of Dividends

Years	1st	2nd	3rd	4th	Total
Dividend Amount	12.5	12.5	12.5	12.5	-
Terminal Value	19.01	16.53	14.38	12.50	62.42

(Compounded at 15% p.a)

PV of the Preference share at 4^{th} year end

= (5^{th} Dividend + Maturity Value) / (1.15)

= (12.5 + 100 + 5) / 1.15

= (117.5) / 1.15 = 102.17

Total money that you will have at the end of the 4^{th} year = 62.42 + 102.17 = Rs.164.59.

(b) Equity Share Valuation

As to equity share valuation we have different models Constant dividend model, constant growth dividend model, earnings capitalisation model, book value model, market value model; etc are certain models dealt here.

Constant Dividend Model assumes a constant and perpetual dividend per share Given the desired rate of return, ie., the 'r' we can use the 'E/r' model. A share is promising an annual Rs.4 dividend for an endless period. If expected return = r = 20%, find the value of the share: PV = E/r = 4/20% = Rs.20. This model lacks progmatism as constant DPS is not usually the case.

Constant Growth Dividend Model, assumes a DPS that grows by certain percent 'g' annually. The PV = E/(r-g), where E_1 is next dividend, r = expected rate of return and g = growth rate.

Last year a company paid Rs. 5 as DPS is growing at 10% p.a. Expected return is 20%. Then, PV = Last Dividend (1+g) / r-g = 5 (1+10%) 20%-10% = 5.5/10% = Rs.55. This is an improvement over the previous model, though constantly growing dividend is not easy to obtain in real world. Dividend

models may not reflect true worth of a scrip. Growth firms prefer to pay less and retain more so that cheapfunded growth and diversification are possible. But this low payout might put share values at reduced levels. Declining firms may pay very high dividends. because they have no investment plans. So, the dividend model will put high value on those shares, though in reality these are not so. Hence earnings model can be used. This follows: .

Earnings Capitalisation Model involves the EPS being capitalised. Say the EPS = Rs.8. And capitalisation rate is 20%. The PV of the share = Rs.8/20% = Rs.40.

EPS is unaffected by dividend pay-out ratio.

The other two models viz book value and market value, are already presented in this unit in the beginning.

Illustration

A company had been declaring Rs.2. 2.2, Rs.2.42 and 2.66 as dividend per share over last 4 years. Assuming the growth rate in dividend to continue and equity capitalisation rate at 20%. suggest whether it can be bought for Rs.25.

Answer

The PV = $E_1/r-g$

The growth or 'g' of dividend is 10% as could be seen from the figures. So. next dividend = $E_1 = E_0(1+10\%)$, where E_0 is last dividend or Rs.2.66.

So, $E_1 = 2.66(1.1) = 2.93$. So,

$$PV = 2.93 / (20\%-10\%) = 2.93/10\%$$
$$= 29.30.$$

The share may be bought at Rs.25, as its intrinsic value > price.

Appropriate Discount Rate or Required Rate of Return or Capitalisation Rate or "r"

In our analysis we have been using one r", referred to as required rate of return. What should be the quantum of the same? This depends on the risk involved in that scrip or share. The following table gives appropriate level 'r' for diff. Levels of risk.

Table 3.2

Risk Level and Discounting Rate

(Adapted from Management of Investments by J.C.Francis)

Level of Risk	Level of Discounting Rate
Very Low	8%
Low	10%
Low Medium	12%
Medium	14%
High Medium	16%
High	18%
Very High	20%
Speculative	25%
Very Speculative	33%
Gamble	50

Bond Valuation

Bond valuation is very much similar to valuation of preference shares. ready dealt. Valuation of irredeemable bond corresponds to valuation of irredeemable preference shares and valuation of redeemable bonds corresponds o valuation of redeemable preference shares. Just you have to use interest instead dividend. So, you may please refer to valuation of preference shares for models of bond valuation.

PRICE-EARNINGS (P-E) ANALYSIS

Price dividend by Earnings is an important measure of worth of a security. Say a share is quoting at Rs.195 in the market and the EPS is Rs.39. Then P-E ratio comes to Rs.195/ Rs.39=5. The inverse of PE ratio is the market capitalisation rate of the scrip. In this case it is 20%.

From P-E ratio, intrinsic value is obtained by multiplying EPS by P-E ratio.

Intrinsic Value = EPS x P-E ratio. And,

Expected P-E ratio = Intrinsic Value / EPS

= (Dividend) / (r-g) / EPS (on the basis "D+g" model)

= (Dividend / EPS) / r-g

= Payout Ratio / r-g

Use of P-E Ratio

We can calculate actual and expected P-E ratios, which can be used for investment decisions.

$$\text{Actual P-E Ratio} = \frac{\text{Current Price of a Share}}{\text{Current EPS}}$$

$$\text{Expected P-E Ratio} = \frac{\text{Intrinsic Value}}{\text{EPS}}$$

If Actual P-E ratio is > Expected P-E ratio, the stock is over priced and it must be sold before its price falls.

If Actual P-E ratio is = Expected P-E ratio, no trade is suggested.

If actual P-E ratio is < Expected P-E ratio, the security is underpriced and hence a hold and buy and hold strategy is good.

How Expected P-E can be improved?

$$\text{We know, Expected P-E} = \frac{\text{Payout ratio}}{\text{r-g}}$$

By enhancing the numerator, by enhancing "g" and reducing "r' Expected P-E ratio can be maximised. Payout ratio and "g" can be manipulated. but "r" is a market determinant. Declining firms, by manipulating payout ratio and "g" present an inflated expectd P-E ratio for a short – while This cannot be sustained. But growth firms, can sustain a higher expected P-E ratio, because in their case "r" is sub-dued as market respect the firm and

accords a low risk premium. Thus even if pay-out ratio is lower and "g" also is lower, through a lower "r", these firms can user into a higher expected P-E ratio.

Illustration

Compute actual and expected P-E ratios given, Current price Rs.60; DPS = Rs.4; EPS = Rs.6; r=18%; g=8%. Advise on investment decision.

$$\text{So, Actual P-E ration} = \frac{\text{Current Price}}{\text{EPS}}$$

$$= 60/6 = 10$$

$$\text{Expected P-E ratio} = \frac{\text{Payout ratio}}{\text{r-g}} \text{ or } \frac{\text{DPS/EPS}}{\text{r-g}}$$

$$= \frac{\text{Rs.4 / Rs.6}}{0.18 - 0.08}$$

$$= 6.67$$

$$\text{Alternatively, expected P-E ration} = \frac{\text{Intrinsic Value}}{\text{EPS}}$$

$$\text{Intrinsic Value} = \frac{D}{r-g} = \frac{\text{Rs.}4}{0.18-0.08} = \text{Rs.}40.$$

$$\text{So, expected P-E ratio} = \frac{\text{Rs.}40}{\text{Rs.}6} = 6.67$$

This scrip is overpriced as its actual P-E > expected P-E ratio. It must be sold out immediately, if it is held.

P-E Analysis a marriage between Technical and Fundamental Analysis

Later in Units VI and VII you will learn fundamental and technical analysis. For the moment, it is suffice to say, technical analysis and technical analysts use price data very much in their investment decisions, while fundamental analysis and fundamental analysts use earnings data very much. In P-E analysis, thus two schools are wed-locked and coverged, because both price earnings are used.

Generally, a high P-E indicates enormous demand for the scrip, even though EPS is small. This can happen only if the scrip is a darling of the market, the management is good and potentials are fine. Else, there must be enormous liquidity and speculative interests in the scrip. Any case P-E ratio exceeding 15 indicates enormous heat or enormous expectation. If it is the former, better don't hold on to the scrip

A low P-E is a sign to hold and buy-and-hold, provided liquidity is fine and potentials are good. Most illiquid scrips have low P-E. and they are not

good candidates to invest. AP-E ratio of less than 5 indicates a buy signal, provided other things are good.

So, you have to go beyond P-E ratios. You have to go into potentials, liquidity and related aspects.

Questions

1. Explain the meaning and aspects of investment analysis
2. Explain the different concepts of returns and measures thereof
3. Compute appropriate returns on a bond with following features. Coupon 18%; maturity 3 years hence current price Rs.900 and maturity value Rs.1000.
4. The past dividend on the share is Rs.5 and its next expected dividend Rs.10% more. Its current price is Rs.40 and actual price was Rs.25 when it was bought. Calculate current and actual yield.
5. Calculate the expected yield given the following

R_i :	12%	14%	16%	18%
P_i :	.2	.3	.3	.2

6. Explain the concepts and broad classifications of risk
7. What are the different components of total risk ? Explain them
8. What are financial and market risk ? How these can be reduced ?
9. Give and account of different measures of investment risk.
10. Given below are the annual returns of three companies over a 6 year period. Which is more volatile? Which is less volatile per percent of return?

Return:	A	14	18	25	-2	7	17
	B	12	13	12	10	12	12
	C	12	0	-5	20	20	3

(Hint: for the 2[nd] sub question calculate coefficients of variation).

11. The probability distribution of return of a scrip is as follows:

Returns :	15	18	20	25
Probability	-2	-3	-3	-2

Compute risk,

12. Compare the two securities A and B given the following

Return on A	:	14	22	25	7	-2
Return on B	:	7	4	0	13	18
Return of Market:		22	27	30	10	?

(Hint: Calculate Bata for A and B and compare)

13. The opening quotations of scrip and Opening index value of stock price index of 8 days are given, calculate risk of the strip, the market and comparative risk of tne scrip.

Price (Pr) :	42	46	48	46	46	50	55	56
Index :	112	115	116	120	122	119	120	127

(Hint: First compute return on the scrip and return on the market for the first 7 days. From the respective returns calculate absolute risks. Comparative risk is nothing but beta).

14. What is portfolio risk? Compute the same given the bata and weight of individual scrips in the portfolio:

	A	B	C	D
Beta:	2.1	1.5	1	1.2
Wt :	20%	30%	40%	10%

(Hint: Simply weighted average beta is required).

15. Calculate portfolio risk given:

	A	B	C
Std. Deviation	4	5	7
Weight	40%	30%	30%

Correlation : A & B = 6; B&C = -0.7 and C&A = .2

16. Explain the concepts of value and valuation models of preference shares.

17. Explain valuation models for bonds

18. How are equity securities valued?

19. What factors influence the intrinsic value and price of a scrip? How are investment decisions made using Cootner's Model?

20. What is P-E ratio or Earnings multiple? Explain the significance of P-E ratio in investment decision.

21. You have to go beyond P-E ratio. Comment

22. An equity scrip has returned a dividend of Rs.3, 3.3 and 3.63 past three years. If the "r" is 20%, expected EPS = Rs.6 and current price is Rs.40, suggest whether it is a good buy using actual and expected P-e ratios.

23. A Rs.1000 face valued bond is going at Rs.850 now. It has 3 years to maturity. If the coupon rate is 15%, r=20% and redemption dividend is 5% find whether it can be a good bet for money.

24. Present Value-Price interaction model.

25. Find the value of a 3 year bond, face value Rs.1000, with 14% coupon and "r" (ie., expected yield to maturity) (i) 12%, (ii) 14% and (iii) 16% 11. What will be PV of preference share whose face value is Rs.500 and coupon is 16% When (i) r = 20% and maturity period 2 years and (ii) r = 20% and maturity period 3 years.

LESSON – 4

APPROACHES TO INVESTMENT ANALYSIS

There are two main approaches to investment analysis, viz., fundamental analysis and technical analysis. Fundamental analysis is committed to find the true value or worth or 'intrinsic value' of an investment vehicle like a share, bond or so. Technical analysis is concerned with forecasting prices of investment securities as against their values done in fundamental analysis. A detailed description of these analysis are given below.

Fundamental Analysis

Fundamental analysis is concerned with the real value of an investment. An investment gets value from what it returns and the risk associated with it. So, by finding the returns and risk adjusted required rate of return value can be worked out. Fundamental analysis finds the intrinsic value of an investment by finding the present value of future cash earnings. To find the same forecast of the timing and size of cash earnings is needed. Besides, appropriate discounting rate is needed. Thus lot of forecasting tasks are involved in fundamental analysis.

Cashflow earnings is made adopting several methods. Top-down forecasting, bottom-up approach, probabilistic forecasting and econometric modeling methods are used.

The **top- down approach** involves forecasting the scenario of the economy first, of the industry next and finally of the company at last. General economic conditions influence the industry potentials and industry conditions

influence company potentials. Thus forecasting of cash flow starts from top end. This is generally considered as a right approach

The **bottom-up approach** involves forecasting the company potentials first. Later these are adjusted for expected industry trends. Finally, refinement for macro economic conditions is made. This approach is not considered perfect.

The **probabilistic approach** involves placing probability values to alternative economic scenarios and to industry scenarios. From this, expected economic earnings for the company can be estimated. And from that cash flow on investment can be estimated.

Economic models can be used to forecast. Exogenous and endogenous variables influencing cash flow from investments can be modelled and simulated to forecast cash flow.

The exogenous variables are external to the organisation whose cash flow we are estimating. Exogenous variables include macro-economic factors like GDP,GDP growth rate, interest rate, population, R&D,. technology, political stability and policy, direct taxes, indirect taxes customs duty, etc. besides industry factors like competition, market share, entry barriers, or free entry, etc. are also exogenous. High GDP growth, low interest rate, more public spending on infrastructure, lukewarm competition, etc. will lead to higher sales and higher cash earnings. Also endogeneous factors-factors within the control of the organisation, such as product-mix, labour relations etc. also

affect sales and hence cash flow. By modelling and simulating the exogeneous and exdo-genous factors on cash flow (C), cash flow forecasts can be made.

Also we have to forecast the discount rate or expected minimum return (K). It is the inverse of P\E ratio. The discount rate should reflect the risk free rate of return and risk premium.

Of we assume a constant cash flow to get returned from the investment, the intrinsic value of the investment is = cashflow / discounting rate or C/K. (You may recall in an earlier lesson we used "E/r" to get the intrinsic value. Only notations are changed here).

If we assume that the cash flow from the investment is increasing at a constant percent year after year, the growth model is to be used. Then the intrinsic value for the investment is C1 /K-g, where "C1"is the expected cash flow one year hence, "K" is the discount rate or the minimum expected return.

Intrinsic value is not a static figure. It is dynamically changing to reflect the changes in economic, industry and company conditions, in an efficient market, the market price of an investment hovers around the intrinsic value, if not coincides with the same.

❖ Components Of Fundamental Analysis

Return and risk factors are influenced by economy-wide factors, industry factors and company factors. Economy, industry and company analyses thus constitute fundamental analysis. It is very true that return and risk of an

investment security depends on the general economic conditions. industry trend and company specific factors.

(A) Economy analysis

Economy-wide factors such as gross domestic product. gross national savings. gross national investment. capital formation. capital productivity. incremental capital output ratio. technological advancement and research and development orientation, natural resources. population growth and size. education, skill, entrepreneurship and value system of the people. social and cultural factors. religious attitude. level of employment. economic system. fiscal monetary and trade polycies. public and private sector-structure. size and symbiosis. primary, secondary and tertiary sectoral development balance. capital market development, balance of payments. foreign capital and technology flow. exchange rate. infrastructural development political stability. external relations and internal security. etc. create the ground for business operations.

These factors constitute the environment in which industries and industry institutions operate. Highly supportive environments help business grow well. For instance monetary policy influences the quantum and cost of credit available. A liberal policy helps industrial units, while a stringent policy constrains business units. As a result return and risk varies. Free flow of foreign capital helps industries to access state of the art technology from abroad and go for strategic alliances affecting positively return and risk. Free import of consumer goods affects domestic firms and their return and risk get affected. Thus availability of capital and cost of capital. access to technology and cost of the same. market size. structure & growth. marginal productivity of labour and

capital, etc. are influenced by economy-wide factors. Some industries, some firms, some regions, some factors and some sections may be favoured by political decision affecting return and risk of business benefited directly or indirectly by such favours.

Trend in these factors must be studied and a forecast be made of likely macro-economic scenario and its impact on industrial units. Some of the macro-economic factors shall offer an opportunity to a business, some wield a threat, some contribute to strength and the rest weaken a business. Hence a SWOT (Strength, Weakness, Opportunity and Threat) analysis of businessses in the context of the economy wide factors be made. Forecasting of economy wide factors can be made using such techniques as surveys, econometric model, delphi, opportunity model etc. Reasonably accurate forecast will help making right choice of investment which would give high return for a relatively low risk.

(B) Industry Analysis

Investors in corporate equity securities have to make conscious choice of industry or industries in which they may invest with advantage. In a country like ours a wide range of industries is a available, making industry choice a problem of plenty for investors. Besides, significant differences exist in the performance of different industries. At the same time, it is difficulty to find industries that always do well and those hat always do otherwise. Jack Clark Francis would say, "the past is not a good predictor of the future – if one looks very far into the future". So, no formula type course is available n the 'choosing & picking' of industries for investment purposes. A conscious analysis of various factors is called for. This analysis is known as industry analysis.

Factors involved in industry analysis

The life cycle phase, the capital-labour ratio, trend in selling prices and profit margins, advertisement and promotional programmes, research and development expenditures, government patronage/control, risk complexion, etc. are certain factors that affect the performance of industries and hence investor choice.

Life Cycle: The life-cycle of the industry is very important factor. Every industry has a life cycle as individuals do. Introduction, growth, maturity and decline are the four phases of life cycle of an industry. In the introductory phase products of the industry require market acceptance. Initially revenue might be less than expense. When products gain acceptance of the market, the industry is emerging into a growth industry. Such emerging growth industry is the best bet for investors. Certain agro-based business like flori-horti culture, fast-food services, resorting on time-share basis and the like are in this phase in India. Shares of such emerging growth industries have a lower P/E ratio, indicating that they are good to buy. The growth phase follows the introduction phase. Profits are high. Many are interested in the securities of growth industries. Taking advantage of this, the industry floats additional equity/bond issues. Usually issue prices are higher now than those of the introduction phase, but still considerably lower than the real worth. Hence, those who missed the industry in its introduction phase, can now make their bet. The later phases of life cycle of an industry viz., maturity and declining, are time to unload your holdings.

Capital-Labour ratio: The capital-labour ratio throws light on the technological state of the industry. A high ratio indicates high capital intensiveness and vice-versa. In these days of escalating labour costs-both out of pocket and inputed costs, coupled with less than commensurate efficiency of labour. capital intensiveness is preferred by emerging industries. Investors therefore stand to gain if they cast their lot with industries with high capital-labour ratios. It may be observed that most blue-chip companies in India invariably have a higher capital-labour ratio. One Japanese executive would tell that wage rates are low in India. but labour is costly. due to inefficiency. Hence investors stand to gain if they go for industries which are less labour intensive.

Selling Prices & Profits: Trend in selling prices is important factor. An industry which is fortunate to command higher and higher prices for its product is slated to do well. Among the primary commodities, fruits, condiments & spices and milk have sported a higher price rise between 1981 and 1993. The wholesale price indices, 1981-82 = 100 for above three primary commodities stood at 308, 465 and 294 respectively in May 1993.while the average index stood at 274. While ferrous metal products registered a lower rise in price (index no.253 in May 1993), non-ferrous metals registered a higher rise with an index no. of 338. While the price index of soft-drinks and carbonated water reached 321. for wine industries it was only 179. Drugs and medicines registered a low price rise (Index no.174) while. Perfumes. cosmetics and toiletries registered a high price rise (Index no.241) and so on. Demand factors. control on price, product features. life style, etc. affect prices. Investors should pick up industries that have no difficulty in rising selling prices of their products.

Profits and EPS: Selling prices are not than relevant, if profit margins are slim. Selling prices should be moving upwards, costs should record a lower rise resulting in higher profits. Scale advantages also contribute to profits, the earnings per share (EPS) should be higher and growing. The method of financing and costs of financing also affect EPS. So investors should pick up industries which show higher rise in profit margins and EPS.

Advertising: In a world of competition, advertisement and publicity are means to create an edge over others. The products should lend themselves to be advertised. Repeat purchase products are a class in point. Detergents, textiles, cosmetics, hygiene products, health drinks, etc. come in this category: Through conscious advertisements people's life styles are changed such that they spend more on the above class of products. The concern for cleanliness, health, good appearance, etc. are effectively raised through media ads. That is why products of Ponds, Hindustan Lever, Bajaj, Reliance, SmithKline, Nestle, Brooke-Bond and ITC are in great demand. The market shares of these concerns have already risen to dizzy heights. Partly due to the corporate and brand images created by ads. Consumer goods industries are, therefore, good outlets for making investments. Now pharma-sector is growing swiftly and pharma-scrips are continuing an uptrend.

R & D: The level of research and development (R&D) expenditures by industries indicates whether or not they continue to make innovations. Industries that are not continually innovating shall cease to exist sooner than later. Consumer oriented product, process, marketing and financial innovations are called for. A good deal of commitment of financial and non-financial resources need to be made for building R&D. R&D pay in the long run, though

not in the short-run. Investors with a longer time horizon will do good by picking industries who commit themselves for purposeful R&D. the number of formulations, trade marks, patents held by industries indicates their technological innovativeness. Prefer to invest in those industries who have built a competitive edge through R&D.

Concessions: Government patronage in the form of tax-holidays, duty reliefs, concessional financial assistance, price-preference, etc. angus well for the recipient industries. Withdrawal of restrictions are al good as extension of particular privileges. Decontrol of price of products, free exit policy and the like have immense benefit for the industries. Decontrol of prices of molasses, cement and steel have brought to limelight the scrips of the concerned industries in India. Alert investors do not lose time in bettering on industries that receive a government concession or are relieved of certain governmental restrictions.

Risk Beta: The level of risk associated with each industry should be kept in mind. Risk and reward move in the same direction, though probabilistically minimisation of risk given the expected return is the rational course. Beta is a measure of non-diversifiable risk. A beta value less than 1 means the industry is less risk and a beta value, say excess of 1 means the industry is highly risky. Barr Rosenbery and James Guy measured the beta of several industries in the USA. Construction, Apparel, Media, Producer goods, Business, Consumer Durables, Electronics, Air Transport, Retailing, Finance, Insurance, Real Estates, Tourism, Motor Vehicles, Entertainment Non-durable, Freight Transport and Business Services Industries are highly risky with beta varying between 1.28 and 1.80. Those of these, that provide a high relative yield.

commensurate with risk can be preferred. Non-ferrous metals, ferrous metals, energy raw materials, liquor tobacco, containers, food products, A rest products, chemicals, drugs, soaps, oil, Shipping. Rail-Roadways.. Telephone and banking industries have moderate risk with beta varying between 0.75 and 1.2?. Energy utilities and fold carry the least risk with respective beta measuring 0.60 and 0.36. Risk-seeking investors may go for high-beta industries while the moderate risk takers may pick up industries with beta value around 1. The risk preference of the investor and risk complexion of the industry should match.

Security Prices: Lastly, how do the different industries fare as to trend in security prices is to be seen. The All India Industries ordinary share price index. 1980-81 = 100, rose to 854 by 26th June 1993. Against this average bench mark figure, the ordinary share price indices of tea plantations, (2580), tobacco (5606), aluminium (3245), cement (906), electricity generation and supply (1556), trading (1074) and hotels (1117) have been very much on the higher side as given in the parentheses as on 267th June 1993.

So. investment in the above industrial scrips yields spectacular capital gains. Certain industries like finance, shipping, paper, rubber, dyes, man-made fibres, pharmaceuticals, electronic machinery, other machinery foundaries, jute, cotton textiles and sugar have reported share price indices in the range from 167 to 669. The investors in these industries have no hopes of any outstanding capital gains on their share holding. Investment decisions as to choice of industry should be taken in the light of trend in share price indices. Industries that have propensity to record faster rise in equity prices should interest investors.

In a nutshell emerging growth industries and growth industries in terms of market size, product selling prices, profit margins, government concessions and share prices, are better investment outlets.

(C) Company Analysis

Company analysis help in making right choice of companies in the selected industries. Technology, R&D. foreign collaboration. technological edge, innovative skills, capital structure, capital cost. leverage benefit, market size and share, competitive strength. brand equity, product mix, entrepreneurial and entrepreneurial skills of propel of the organisations. employee-employer relations. managerial excellence. leadership vision, employee culture and skill. organisational climate, export market, raw material sources and quality. infrastructural facility, access to natural resources such as water, minerals. etc. public relations. governmental relations. tax factors etc. influence return and risk. In short marketing vitality. technological viability. financial strengths. managerial excellence, personnel resourcefulness. environmental orientation, etc. influences risk and return of a concern. Profit analysis turnover and market analyses. capital structure analysis. liquidity and solvency analyses. risk analysis. personnel and managerial skill analyses. and technological and environmental analyses constitute company analysis. In each case. the SWOT factors should be analysed into an impact or risk and return factors. From them, the value of the concern and value of investment instrument concerned should be found. A futuristic vision should be entertained in establishing the intrinsic value.

Value determination is the thrust and purpose of fundamental analysis. Sure. it is a long drawn out path. Yet a reliable information, a vital information is obtained at the end.

Liquidity Analysis

Liquidity refers to ability of a firm to pay off its short term liabilities as and when such liabilities mature for payment. Sundry creditors, bills payable, bank overdraft, etc must be cleared as and when they are due for payment. To be able to do this, a firm must have cash and readily convertible (into cash) assets. The ratios that are worked with the current assets and current liabilities are broadly called as liquidity ratios. There are three liquidity ratios – Current ratio, Liquid ratio, and absolute liquid ratio.

Current Ratio is the ratio of total current assets divided by total current liabilities. Current assets are cash, bank balance, marketable securities, finished stock, work in progress, raw material stock, spares and sundries, trade debtors, bills receivable, advance with suppliers, prepaid expenses etc. Current liabilities are trade creditors, bills payable, expenses outstanding, bank overdraft or any liability which matures for payment within one year. The current ratio is worked out as follows: current assets/current liabilities.

The current ratio is expressed as "so many times". A current ratio of 3 means, the current ratio assets are 3 times current liabilities.

A current ratio of 2 or more is a sign of fairly strong liquidity position. It is considered as standard. Less than 2 does not indicate a better position.

Even with a current ratio exceeding 2. the liquidity may turn out to be not good if the stock items included are not fast moving. Also. prepaid expenses may not be received back in cash. It will be adjusted against services to be obtained. So. current ratio might conceal more and reveal less. So we are going for liquid ratio.

Liquid ratio is a ratio refined over current ratio. It is also known as quick ratio. It is computed as follows: Quick or liquid assets/Quick or liquid liabilities.

Quick assets = Current assets – stock of all sorts – repaid expenses. Quick liabilities – current liabilities – bank overdraft. As bank overdraft is normally available year after year. it assumes the character of a long term fund technically speaking. Hence it is excluded.

A quick ratio of 1 is considered a good sign of liquidity. It is the standard norm. more than 1 is considered very strong position and less than 1 underlines some difficulty.

Even with a quick ratio of 1 or more than 1 liquidity may not be good if the debtors a bills receivable are not realisable or doubtful. So. further refinement is sought through absolute liquid ratio.

Absolute liquid ration is computed as follows:. (cash + bank + marketable securities) / quick liabilities. The standard norm for this ratio is 0.5.

To have a fine understanding of liquidity of a firm all the three ratios need to be worked out and interpretation made. The three ratios must be used as a group or family. Of course, the ratios are based on the balance sheet data situation. Balance sheet data figures might be "window dressed" or otherwise not representative. Hence, caution must be excersised.

Bankers and other short term financiers, including suppliers will judge the strength of the firm with the help of the liquidity ratios. Investors can also get clues as to the firm's ability to pay interest, dividend, repayment of borrowed capital, etc.

Solvency Analysis

Solvency studies the overall ability of a firm to pay off its liabilities. Solvency is to be long term liquidity and liquidity is short term solvency. Solvency is an important attribute of a business. Long term financiers particularly are interested in solvency of the firm assisted. Debt equity ratio, capital gearing ratio, proprietory ratio, interest coverage ration and debt service coverage ratio are the important 5 solvency ratios.

Debt equity Ratio is the ration of debt-capital to equity of a firm. Debt capital is nothing but borrowed or creditorship capital. Equity is ownership capital equal to paid up equity capital and free regeures.

Debt may be long term or both long term and short term. Accordingly, two variants of debt equity ratio may be thought of viz., (i) long term debt/owner's equity and (ii) All debt liabilities / owner's equity. As per the above methods of computation, a debt equity ratio of 2:1 is considered adequate

for solvency. It not possible to clear Rs. 2 debt liability with assets or funds equal to Rs. 3? It is possible. Higher debt – equity ratio is allowed in the case of high capital intensive projects / backward area projects / small scale industry projects, all with governmental or institutional participation. If a firm's debt – equity ratio is alreay 2:1 or at any other higher allowed level, further debt capital might not be made available as creditors will suspect the solvency position.

Capital Gearing ratio is the ratio of fixed interest bearing security capital to total capital. Debentures, them loans and preference share capital carry a fixed return. Hence capital gearing ratio is computed comparing the above mentioned types of capital to total capital. If a higher ratio is obtained, that means the capital structure of the firm is high geared. That is if the firm earns more, it gains more as it gives a fixed return (which is lower than rate of earning) for a large portion of capital employed. Hence the "high gear". The other one is "low geared" capital structure with lower component of fixed return security capital to total capital. Going by the debt equity norm, a high geared capital structure should involve a capital gearing ratio of 0.7 or more. From solvency point of view a low gearing ratio is advised.

Property ratio is given by: **Proprietor's fund or owner's equity/total assets.** It is a measure of how much portion of the assets of the firm is financed by the owner(s). Going by the debt-equity ratio norm, a proprietary ratio of, say 0.33 or more indicates a larger participation by the owner. Hence higher solvency.

Interest coverage ratio is calculated as follows: **Profit before interest and tax/Interest.** A long-term financier of a firm will be interested in assessing the interest paying capacity of a firm. That capacity emanates from PBIT's size in relation to interest. A higher ratio means higher solvency. Interest coverage ratio of, say 4 or more is considerably a higher side solvency.

Debt – Service coverage ratio is more refined than interest coverage ratio. Here, not only interest paying capacity, but also ability of repayment of that portion of long-term debt which has fallen due is measured. The ratio is computed as follows: PBIT / [Interest + (Principal instalment) / (1 – Tax rate)]. A DSCR of 3 or above is considered a good sign of solvency.

Profitability Analysis

Investors must watch the firm's solvency closely. If the figures are fine they can step up investment. Otherwise, they refrain from doing so.

Profitability measures the extent of profitability of a business unit. There are several profitability ratios. The formulas are presented below. Except EPS. all other rations are given in percentage of sales or capital, as the case may be.

(i) GPR = Gross Profit Ratio = (Gross Profit / Net sales) * 100

(ii) NPR = Net Profit Ratio = (Gross Profit / Net sales) * 100

(iii) OPR = Operating Profit ratio = $\frac{\text{Operating Profit or PBIT} * 100}{\text{Net Sales}}$

$$\text{(iv) OR = Operating Ratio} = \frac{\text{(Cost of goods sold + Operating expenses) x 100}}{\text{Net Sales}}$$

(v) ROI – Return on Investment = (PBIT / Net capital employed) * 100

(net capital employed = fixed assets less depreciation plus current assets minus current liabilities).

$$\text{(vi) EPS = Earnings Per Share} = \frac{\text{Profit after tax – Preference dividend}}{\text{No. of equity shares}}$$

$$\text{(vii) ROE = Return on Equity} = \frac{\text{(Profit after tax – Preference dividend) * 100}}{\text{Owners' Equity}}$$

Profitability ratios are crucial for judging the firm's market or commercial standing. Increasing profit ratios (except operating ratio) are indicative of high market standings Hence investment are better made in these concerns.

The ROI is a special class of ratio. You know it was given as: PBIT / Net capital employed.

This can be written in an expanded form as well:

(PBIT / sales) * (Sales / Net capital employed)

The first component studies profitability as to sales and the second turnover or activeness of capital. ROI can be improved through more activeness, instead of rising selling price to rise profit in relation to sale.

The operating profit ratio and operating ratio are complements to each other. Given the one, other can be known. Operating ratio = 100% operating profit ratio and operating profit ratio = 100% operating ratio. Like operating ratio, we can think of a sorts of expenses ratios by comparing each such expense to sales.

Turnover or Activity analysis

Turnover or activity measures how efficient the assets of the firm in creating sales. How many times they are turned over to effect sales? There are several turnover ratios as given below.

(i) Stock turnover ratio (composite) = $\frac{\text{Cost of goods sold or net sales}}{\text{Average stock at cost}}$

(cost of goods sold = Net sales – Gross profit; average stock = average of opening and closing stocks)

(ii) Finished goods turnover ratio = $\frac{\text{Cost of goods sold or net sales}}{\text{Average finished goods stock}}$

(iii) Working Progress (WIP) turnover ratio

$$\text{Working Progress (WIP) turnover ratio} = \frac{\text{cost of production}}{\text{Average raw material stock}}$$

(Cost of production = cost of goods sold – selling and distribution expenses).

(v) Debtors turnover ratio or

$$\text{accounts receivable turnover} = \frac{\text{Credit Sales}}{\text{Average accounts receivable}}$$

(Accounts receivable – Sundry Debtors + bills receivable)

(vi) Debtors velocity or

$$\text{Average collection period} = \frac{\text{No. of working days in the year}}{\text{Debtors turnover ratio}}$$

(vii)

$$\text{Cash turnover ratio} = \frac{\text{Total cash expenses of operations}}{\text{Average cash and bank balances}}$$

(viii)

$$\text{Current assets turnover ratio} = \frac{\text{Cost of sales or Net sales}}{\text{Average current assets}}$$

(ix)

$$\text{Working Capital turnover ratio} = \frac{\text{Cost of sales or Net sales}}{\text{Average Working capital}}$$

(x) Fixed assets turnover ratio = $\frac{\text{Cost of sales or Net sales}}{\text{Average Fixed Assets}}$

(xi) Total assets turnover ratio = $\frac{\text{Cost of sales or Net sales}}{\text{Average of total assets}}$

(xii) Turnover of capital employed = $\frac{\text{Cost of sales or Net sales}}{\text{Net Capital employed}}$

(xiii) Creditors turnover ratio or accounts payable turnover ratio = $\frac{\text{Credit purchase}}{\text{Average of Accounts payable}}$

(Accounts payable = Sundry creditors + bills payable)

(xiv) Creditors velocity or Average payment period = $\frac{\text{No. of Working days in the year}}{\text{Creditors Turnover ratio}}$

Higher turnover ratios mean higher efficiency and market standing. So. "buy" or "hold" strategy is good.

Leverage Analysis

Leverage is the action of a lever or the mechanical advantage gained by it. It also means effectiveness of power.

The leverage ratios are of three types: financial leverage ratio, Operating leverage ratio and Combined leverage ratio. Financial leverage refers to firm's use of fixed-charge securities like debentures and preference shares in its plan of financing the assets.

DFL = % change in Net income / % change in EBIT

Operating leverage measures the level of fixed costs in operations. A high operating leverage factor indicates the presence of automated production process.

Degree of operating leverage (DOL) measures the effect of change in volume on net operating income or earnings before interest and tax.

$$DOL = \frac{\text{\% change in net operating income}}{\text{\% change in units sold or sales}}$$

The higher the degree of operating leverage the greater will be fluctuations in profits in response to changes in volume.

Degree of Combined leverage (DCL) is the percentage change in net income after interest and tax to percentage variation in sales.

DCL = % change in net income / % change in sales

DCL = DOL * DFL

Concepts of financial and operating leverages are important for evaluating business and financial risk of a firm. Operating leverage refers to the use of fixed costs in operations and it is related to the firm's production processes. The greater the operating leverage the higher is the risk in operations. At the same time, a high degree of operating leverage cause profits to rise rapidly after the break-even point is reached.

Financial leverage refers to the use of debt in financing non-current assets. If the return on assets exceeds the cost of debt, the leverage is successful. That is it improves returns on equity. While this being so, a high financial leverage magnifies financial risk. At some degree of financial leverage the cost of debt rises because of increased risk with the higher fixed charges. When this happens, riskness of the firm also increases in the eyes equity investors who start expecting a higher return to compensate for the increased risk burden.

Capital structure analysis

Capital structure analysis studies debt – equity ratio and capital gearing ratio which throw light on the longterm capital structure features of a firm. These are already dealt under solvency ratios.

❖ Merits And Significance Of Fundamental Analysis

Fundamental analysis is intrinsic value based. Intrinsic value is based on cash earning of the investment and risk associated therewith. Both these are the results of fundamental factors associated with performance of the company such as its productivity, competitive edge, cost efficiency, etc. Again the

company performance is the result of industry and economic conditions. It emerges therefore, that the fundamental analysis is standing on strong foundation like economic conditions, industry trend and company results – all above the reach of speculative forces to breach wilfully and breed a sort of unrealistic terror about the performance of the company. The market value is dependent on intrinsic value and not the other very sound. So, by forecasting the intrinsic value, fundamental analysis is a real guide for investors. Speculators might not find favour with fundamental analysis. To those market manipulators who thrive at the cost of others, fundamental analysis is rightfully not useful. It is not drawback but a merit.

TECHNICAL ANALYSIS

Technical analysis is concerned with forecasting prices of investment securities as against their values done in fundamental analysis. Technical analysis say, 'value' is something not definitely known and which varies from person to person, but 'price' is the 'actual' and is same for all. So, value is a 'mirage' while price is 'real'. Hence they decry the pursuit of fundamental analysis.

❖ Assumptions Of Technical Analysis

Technical analysis is based on certain assumptions. There are: I)in the stock market supply and demand interplay to determine the price, ii)supply and demand are governed by numerous factors, both rational and irrational, iii) stock prices move, despite daily fluctuations, in some pattern with a reasonably longer spell, iv) changes in the pattern happen due to shifts in demand and supply factors, v) shifts in demand and supply can be detected sooner than later

through charts of market action and vi) chart patterns recur and recurring patterns can be used to forecast.

Technical analysis works on the following principles: I)prices are more relevant and more applies than value. ii) for investors it is price that matters much; that is, what is the 'buy' price and what is the 'sell' price are what are needed. iii) price is easily known and value is inputed, imaginary and hence cannot known. iv) in an exchange system transactions are price based and not value based, v) price can be forecast while as to value forecasting is irrelevant and vi) stock market operators are more invested in short-term trade gains than in long term gains.

❖ Tools of Technical Analysis

Tools of Technical Analysis are charts. Line chart, bar chart and point and figure chart are the charts used to study the trend in prices, price index, and also volume of transactions.

A Line Chart connects successive trading day's closing price/price indices or volume of trade as the case may. Each day's price is recorded.

A Bar chart is made up by a series of vertical bars or lines, each bar or line representing, a particular day's high and low prices. The closing price of a day is indicated by a small horizontal dash on the day's bar. Each day's price data are thus recorded.

Point and figure charts are complex. A point and figure chart records only significant price change. Thus, if for several days no significant price

change takes place, no entry is made in the chart. Significant change in price must be seen in the light of price of a share. For a share in the price band of Rs.1000-1500 or so, a price change exeeding, say, Rs.15 may be taken as significant, whereas for a scrip in the price range of Rs.100-150, a change in price of the order of Rs.3 or more may be taken as significant. Upward significant moves are indicated by 'x's in the same column. Say for a scrip of Rs.3 change is taken as significant. It moves from Rs.98 to Rs.101. One 'x' is market. Next day it moves to Rs.105. Another 'x' in the same column, above the previous 'x' is put. The same day it moves to 107. One more 'X' is put. Next day price drifts by Rs.2. No entry is made. The next day price falls to 104. A 'O' is made in the next column . Further down in price will be recorded in this column. If a significant increase in price takes place, next column of 'x'will be charted.

❖ **Theories Of Technical School**

There are several theories of the technical analysis school. Dow theory, oddlot theory, short sales theory, etc are some notable ones. These are dealt with below.

DOW Theory

DOW theory, propounded by charles Dow around 1900 AD, is the first ever proposition of technical analysis. Though propounded that earlier, it came to be rocognised in 1929 AD, many years later the demise of Dow. Dow's theory helped predicting the Great World Depression of 1930s. Only after the prediction came true the theory drew attention and gained popularity.

Dow's analysis puts share price movements as of 3 types – the daily fluctuaitons (random wiggles) having no meaning, the Secondary movements (lasting for a few months) called as technical corrections and the primary trends (indicating bull and bear markets) lasting for a year or more.

A bull phase is established when successive peaks are higher than the preceding peaks. When, a successor peak is lower than the preceding peak the bull phase ends and bear phase starts. When successive 'lows' are than preceding lows the bull phase ends and bear phase starts. When successive 'lowes: are lower than preceding lows the bear phase continues. It comes to an end when the successor 'low' is higher than the predecessor 'low' and bull phase results when the above trend gets established.

An 'Abortive recovery' happens when prices rally after the previous peak. But it could not be sustained and no new peak is established. The horizontal line drawn tangentially to connect the low points on either side of the high peak is known as the neck line. The highest peak is called the head. The previous peak is referred to left shoulder. The successor peak (ie. to right of head) is known as right shoulder. When price rises, the previous peak is the immediate target. It is a resistance area, psychologically. If price rises above the previous peak, the resistance area, price is said to have broken through. This is called break out. Similarly when price falls, a previous low price area, is taken as the support area, for when price reaches that level, investors who have failed to buy earlier, might buy now and the down trend arrested. But if this does not happen and price continues to fall, price is said to have penetrated down. Dow theory is a remarkable contribution to technical analysis.

Country Opinion Theories

There are two theories here. In each case contrary opinions can be drawn. Hence the name.

a) Odd lot theory

Odd lot refers to less than market or round lot. In stock markets, 100 shares in most cases constitute a full or round lot. For high prices stocks, 10 shares constitute a round lot. Odd lot theory is used to predict tops in bull market and reverses in individual securities. Odd lot purchases and odd lot sales can be used to predict market trend. If odd lot sales exceed purchases, a bull market is predicted and vice versa. The daily 'net' odd lot trade position can be related to any market index and relative pattern of movement can be studied and prediction may be made on this basis. But contrary to odd-lotters also do professional judgements and buy "low" and sold "high".

b) Short Sales theory

Short sales are sales without owning the scrips. The seller is hoping a fall in price and will buy the scrips low later to effect delivery for the earlier short-sale contract. Should prices move upwards, a short seller would burn his fingers. Rising short sale volumes might foretell the beginning of bull market (according to some) or the end of bull market (according to others). Former's view point is that due to vast uncovered portion, buying pressure will result to rise prices upward. Palatter's view point is that short sellers are good at market forecasting. Had they not foreseen a end of bull market, they would not short sell. Hence the contrary opinions. Hence this theory and the odd lot theory are known as contrary opinion theories.

Breadth of the market

Breadth of the market is based on net advances and net declines. The 'advances' refer to number of scrips whose successive day's prices are more than the preceding days price. The 'declines' refers to number of scrips, whose succeeding day's prices are lower than the previous days price. When 'advances' exceed 'declines', there is net advance. Cumulative value of the "nets" is called breadth of the market. Say the following "net's" resulted during a 7 days trading: 150, 50, 75, (30), (10), 20 and 50. The breadth statistics is: 150, 200, 275, 245, 235, 255, 305. Breadth statistics (ie. advance-decline line) and a market index (say BSE Sensex) are plotted on a graph. They normally move in tandem. If, however, breadth troughs and market index peaks, the situation indicates, blue chips rise in value, while others slide down and a bear market is in store or has already set in.

Moving Average Analysis

Moving average of prices gives a smoothened price picture in a period of extremes 200-days moving average is a very often used technical theorists tool. 200-day moving average is obtained by adding the closing prices of 200 preceding trading days of a scrip and dividing the total by 200. Next day the process is repeated by deleting the 1st day's price and substituting 201st day's price. The moving average prices and daily prices can be plotted and line charts made. If the daily prices chart drops down through the moving average prices chart, the situation indicates a downtrend for the scrip and it is better to sell the same. When daily prices line is above the moving average, but the gap is narrowing the situation indicates the end of bull phase. A bull phase is said

to be setting in when the daily prices line crosses upwards through a flattened moving average line and when the daily prices line crosses upwards through a flattened moving average line and when the daily prices line that is about the moving average line falls down the latter but turns upward and is about to cross upwards the moving average line. 10-day, 50-day and 100-day moving average and useful for short-term traders.

Elliott Wave Principle (EWP)

EWP is an important theory of technical analysis. EWP was established in 1930 by R.N.Elliott. According to him, that major moves in stock price take place in five successive steps resembling tidal waves. A major bull phase thus will have first uptrend, second downtrend, third uptrend, fourth downtrend and fifth uptrend. Uptrends will be lasting type and steeper, while downtrends will be short-term and less steep.

Relative Strength Index (RSI)

Relative strength refers how strong a security or investment is in bullish and bearish market. The relative strength shall be considered to be high when the scrip rises faster in a bullish market than the industry and the whole market and falls slower in a bearish market than the industry and the whole market. In an ascending market it must outsmart others, in a descending market it must be able to hold itself up and keep its ground. That is relative strength. Accelerated upward move and decelerated downward move thus constitute relative strength. It can be applied to individual securities or the whole market. In the later case other market have to be taken as the bases for comparison.

Relative strength index can be worked out with stock price of the scrip and stock averages of the industry and the market over a medium term period. Alternatively, scrips that post historically high return can be taken as those with relative strength.

Given below are the average stock price of the scrips of concern "a", belonging to industry A and stock price averages of the industry A and stock price averages of the market "M".

	"a"	"A"	"M"	a/A	a/M	A/M
1995	40	200	320	0.20	0.125	0.625
1996	45	240	340	0.21	0.132	0.618
1997	90	250	420	0.36	0.214	0.545

Here the scrip "a" had been advancing faster and steadier against both its own industry average and market average as seen from a/A and a/M column figures. The A/M column figures are falling which indicates that scrip "a" has to be much smarter, then only even though the industry to which it belongs to is falling against the market, the scrip is rising against the industry. That is, even under a less accelerating industry condition, it is outsmarting the market. Hence its high relative strength.

When deceleration is the case, a lesser deceleration is seen as strength. Consider the following figures and ratios.

	"b"	"B"	"M"	b/B	b/B	B/M
1995	45	97	320	0.46	0.141	0.303
1996	42	87	295	0.48	0.142	0.295
1997	37	70	255	0.52	0.145	0.274

Here the industry / market ratio is declining, indicating the industry concerned is going at high deceleration. But the firm (ie., "b") is rising. Even the industry deceleration is not hurting the firm's way. It is falling, no doubt revealed by absolute figures. But the rate of fall is slower than that of the industry and the market. Hence, the relative strength index.

Investor should put their funds relatively stronger scrips by moving away funds from weaker scrips.

Confidence Index

Confidence, here, refers to investor confidence in the market. Confidence index, therefore, measures, how willing the investor is in taking chances in the market.

Who has to take chance? Those who were hitherto, cautious, now have turned confident enough to take chances. That is confidence.

When investors turn confident, they shift funds from high rated, say AAA bonds, to low rated, say "BBB" bonds. As a result, the interest rate on "AAA" bonds will have to rise (due to lack of investor interest) and interest rate on "BBB" bonds has to rise (due to more demand from investors). Say earlier

the two interest rates stood at 12% and 15% and now after confidence building, the rates have become 13% and 14%.

Confidence Index (CI) is given by ratio of interest yield on high rated bonds to that of interest yield on low rated bonds.

So, the earlier level of CI: 12% / 15% = 0.80

The current level of CI: 13% / 14% = 0.93

Of course, CI cannot be more than 1. It might approach 1, but will not reach 1. When general economic conditions are good, investors turn optimistic and take risk, by going for riskier investments, reducing their exposure in risk-free investments or less risky investments.

An increasing confidence index, is an indication of an impending stock-boom and a decelerating CI indicates the impending stock market depression. A point – and – figure chart can be used to depict CI statistics. Every fhalf-a-percent change in CI may be recorded. In the US market, the mini depression of 1969-70 was documented by falling CI in the preceding 2 years.

Who causes CI moves? The "smart money" investors. Smart money refers to capital that enters in an industry at the right time to book early quick gains and that moves out just before the industry fortunes get reversed. Smart money "lands on" at right time and "takes off" again at right time. In a boom market, smart money investors are quick to shift funds into low rated bonds to gain more (and chances of bad investments are minimum) and in depression they quickly shift funds to high rated bonds (to avoid loss of capital). And their

moves, moves the confidence index and other investors should try to adopt portfolio changes by reading confidence index statistics.

COMPARISON OF FUNDAMENTAL AND TECHNICAL ANALYSES

Fundamental analysts try to find the intrinsic value, while technicians try to forecast price.

Fundamental analysts are interested in the 'why', while technicals are interested in the 'what'.

Fundamental analysis serves long-term, buy and hold investors, while technical analysis serves short term traders and speculators.

For fundamental analysts distinction between current return and capital gain, is relevant, while it is not so for technicians.

Technicians adopt the style of indiscriminate buy 'low' and sell 'high' while 'fundamentalists' buy only scrips that are intrinsically superior and sell that are intrinsically interior.

Technicians are of the view market fall and rise repeatedly. They see only the market price. Hence their tools are charts and graphs. Fundamental analysts use modeling, ratio and other forecasting tools.

Breakouts and Penetrations are what the technicians look for. Fundamental analysts look at management strengths, competitive edge, etc.

SOME CHART PATTERNS

There are several chart patterns. As chart pattern recurs, prior knowledge of chart of a particular scrip / index helps forecasting future price or index value.

Here certain chart patterns are explained.

Fulcrum is a chart pattern where prices initially are level. Then falls down. Then a short flat bottom follows. Then prices rise for a while. Then get leveled. In the inverted fulcrum a reverse order follows. That is, prices maintain a level initially. Then start rising Then form a flat top. Then fall. Then get leveled . Once one is fully aware that a scrip follows a fulcrum or inverse fulcrum, he should try to buy it as the prices approach "bottom" and sell when they approach "top".

V-base is a pattern where prices continue to fall for a considerable period in a steady fashion. After reaching the bottom point, prices rise steadily and that a "V" form is obtained. Inverse 'V' – base is also there. Buy "lowest", sell "highest" strategies can be worked out if one knows that a scrip is having 'V' base or inverted 'V' base price pattern.

Duplex Horizontal is a pattern where prices fall initially, almost steadily. Then a bottom is forming. Then a vertical rise results before a high level horizontal move sets in. Later a price rises get established. Inverse Duplex horizontal format is also prevalent.

Saucer and inverted saucer price patterns exist. A saucer pattern involves a smooth and steady fall, a long bottom and a smooth andsteady rise. Its inverse can be guessed.

Channel price pattern involves in series of uniformity altering "tops" and "bottoms". Tops could not be broken-through because of resistance and bottoms are not penetrated because of support. The channel therefore has uniform width. The channel could be flowing horizontally, or sloping upwards or sloping downwards. If however the ceiling or the floor is breached, a definite change in the market conditions start taking place.

Wedge is like a channel. It starts with a steep rise in prices due to positive "words" about the scrip or due to positive results, yet to be confirmed. Then price falls. Then rises. Then falls. Then rises. Every time to successive rise is lower and the successive 'fall' is also lower than the previous. Thus the "top-bottom" gap gets closer as days pass. When, however a penetration or break-out takes place, that is due to definite change in market mood.

Triangle results when a wedge continues until the "top-bottom" gap gets reduced to zero. As effect of price sensitive information vanishes out, a triangle is formed. Triangle indicates the end of uncertainty.

Head and Shoulder pattern is already explained under Dow Theory.

Flag is formed when price rises suddenly, followed by a period of see-saw price movements leading to a "horizontal channel" formation. Any penetration or breakout later indicates a definite change in market sentiments.

Gap is a price pattern where previous day's close and next day's opening prices are marked by different. Overnight change of investors' preferences or overnight change of the scrip's fortunes cause gaps to result. Congestion is a price pattern where a horizontal bond of "X_s" and "O_s" appear on a point and figure chart (PFC). This is created by a series of alternating ups and downs. When forces of supply and demand are in balance, congestion results. A break-out or penetration is an indication of market change. The width of the congestion area is called horizontal count.

Questions

1. Explain the parameters on which fundamental analysis depend on.
2. EIC (Economy-Industry-Company) spectrum analysis constitutes fundamental analysis. Comment.
3. Examine the components of Economic Analysis and their influence on cash flow and expected return.
4. Explain the aspects of Industry analysis.
5. Present the company related analysis as part of fundamental analysis.
6. Account for the merits and significance of fundamental analysis.
7. What is technical analysis? Explain the tools and assumptions of the same.
8. What is 'DOW' Theory? Explain its features
9. What are contrary opinion theories ? Explain them.
10. Explain relative strength and confidence level indices.
11. Explain breadth of market and moving averages as tools of technical analysis
12. Present some chart patterns and how these can e used by investors for better decision-making.
13. Bring out the strengths and weaknesses of technical analysis.

LESSON – 5

PORTFOLIO CONSTRUCTION AND CHOICE

In this Unit Portfolio Construction and choice related aspects are discussed. Markowitz diversification, efficient frontier, risk-return indifference curves, portfolio choice, single and two factorial models and Lagrange Multiplier Method are dealt.

PORTFOLIO CONSTRUCTION

Now the method of construction of portfolios may be explained. Simply you decide the securities in which you are going to invest and how much you are going to invest in each security given your total investible resources. As, proportion changes the portfolio also changes. So, you invest Rs.60,000 in A and Rs.40,000 in B. The proportion is .6 and .5. This is a different portfolio. So, as you change the proportion of investment of the different securities, your portfolio changes. Similarly, when you change the mix of securities then also different portfolios result. So, by changing the proportion and the mix, numerous portfolios can be constructed.

Given the securities, each portfolio is unique. for the portfolio return R_p and Portfolio risk S_p are not same for two portfolios. Either R_p or S_p or both would vary from portfolio to portfolio. Every portfolio can be identified by its R_p and S_p ie. return and risk.

Consider a case. There are two securities Y and Z with which you construct portfolios. $R_Y = 21\%$ and $R_Z = 32\%$; $S_Y = 8\%$ and $S_Z = 10\%$; $r_Y,Z = .5$. These all constants. The variable is the proportion. Let us have portfolio 1

with 20%; 80% mix; portfolio 2 with 50%; 50% mix and portfolio 3 with 20% and 80% mix. The R_p and S_P of three portfolios would be as follows:

R_{P1} = Summ. $W_i R_i$ = .2x 21% +.8x 32% = 29.8%

R_{P2} = .5 x 21% + .5 x 32% = 26.5%

R_{P3} = .8 x 21% + .2x 32% = 23.2%

S_{P1} = (.2x .2x 1x 8x 8 + .8x.8x1x10x10 + 2(.2x.8x.5x8x10) 1/2

= (2.56 + 64 +2(6.4)) 1/2 = (79.36) 1/2 = 8.91%

S_{P2} = (.5x .5x 1x 8x 8 + .5x.5x1x10x10 + 2(.5x.5x.5x8x10) 1/2

= (16 + 25 +20) 1/2 = 7.81%

S_{P3} = (.8x .8x 1x 8x 8 + .2x.2x1x10x10 + 2(.2x.8x.5x8x10) 1/2

= (40.96 + 4 +12.8) 1/2 = 7.6%

So, the three portfolio have unique / distinctive return and risk. Similarly, portfolios constructed with given total sum and given securities will be unique and can be known by their respective return and risk figures.

MARKOWITZ DIVERSIFICATION

Portfolio construction is based on the concept of diversification. Simple diversification. Markowitz diversification and superfluous diversification are certain types of diversification.

Simple diversification is diversification for the sake of diversification. It will reduce risk. but not to the maximum possible level. Here diversification is

randomly done selecting different securities. 10 to 20 securities forming the portfolio will help substantially reducing diversifiable risk.

As against simple diversification, Markowitz Diversification involves combining securities or assets that are less than perfectly positively correlated. We have earlier seen that the correlation between returns of pairs of securities influences portfolio risk. So, Markowitz diversification has a specific purpose, viz., risk reduction. And this is achieved through choosing securities that have negative or less positive correlation coefficients between their returns. In the previous lesson we have seen examples showing how portfolio risk varies directly with correlation coefficient.

Superfluous diversification refers to inclusion of more securities in the portfolio, say more than 25 securities or so. Superfluous diversification does not lead to reduction in portfolio risk and it may cause fall in portfolio return as inclusion of marginally performing assets, increased search and analysis cost, lesser comprehension of the portfolio constituents and added transaction costs lead to deflated return.

EFFICIENT FRONTIER

What is an efficient portfolio? In a given risk class, the efficient portfolio has the highest return. In the same return class, the efficient portfolio has the minimum risk. This is known as dominance. We may put this way. Say the $S_{P1} = S_{P2} = S_{P3} = S_{P4} = S_{P5} = 6\%$. Risk $R_{P1} = 18\%$; $R_{P2} = 31\%$; $R_{P3} = 12\%$; $R_{P4} = 25\%$ and $R_{P5} = 21\%$. Which the most efficient of these 5 portfolios? Obviously, it is P_2 which has the highest return. Take another risk class, with risk = 8%, the returns are 12%, 18%, 33%, 35% and 28%. The efficient

portfolio is one with 35% return. Let us look in the other way. 5 portfolios have the same return, viz. 18%, with risk varying as 4%, 3%, 8%, 7% and 10%. The second one is the efficient one as it has the least risk.

In regard to efficient portfolios, there are some theories – the traditional theory, the Markowitz theory, Sharpe's theory and so on.

The traditional theory adopted 'simple diversification'. Simply, very large number of securities were introduced in the portfolio. Subjective rather objective analyses were used and yet good returns were made. The choice of securities depended on dividend performance, P/E ratio, HPY and the like.

On the contrary, modern portfolio analysis, used return and risk factors in the selection of securities. Further, it is not simply the risk of individual securities that is used, rather what is called as 'intersecurity risk' or covariance is used.

You know when we computed S_P we used the factor.
Double Summ. W_i, W_j, $r_{i,j}$ S_i S_j in our computation.

Actually, ($r_{i,j}$ S_i S_j) is the covariance of the returns of the ith and jth securities. It is not individual security's risk that is relevant. More relevant is the level of risk of pairs of securities. And this is given by covariance, which is equal to: ($r_{i,j}$) (S_i) (S_j). We have already seen that if $r_{i,j}$ is a positive figure, portfolio risk is high, if $r_{i,j}$ is zero the risk is moderate and when it is a negative value, the S_P is lower. So, in portfolio construction, priority for pairs of securities with negative, zero or very low positive correlation be given. With

this approach, even with a much smaller number of securities, say some 15 securities. we can completely diversify away the non-diversifiable risk. That is with just 15 different securities portfolio with lower risks can be constructed. It is this that Harry Markowitz theory of portfolio emphasises. Beyond a well chosen 15 securities, further diversification, ie. introducing more securities in the portfolio does not significantly reduce portfolio risk. Such diversification is 'superfluous' with no concrete benefit.

Now the concept of efficient frontier may be discussed. It was introduced by Markowitz. With a given investible fund and given number of securities atleast two. we can construct innumerable portfolios, by simply changing the proportions of individual securities. And each portfolio has a specific R_P and S_P. If we take return on x axis and S_P on y axis, each portfolio can be represented on the graph given below. Each dot is a portfolio. The shaded area represent the attainable set of portfolios. ie. all such portfolios that are feasible with the available fund. But all these attainable portfolio are not relevant. The relevant ones are the portfolios on the curved path E_1 E_2. Each portfolio on this curved path is superior to those in the shaded area. Take a point on the curved path, M. M is superior to all portfolios, on MN line, as all are of the same return class, but M has the least risk. Similarly, the portfolio G on the curved path is superior to all on the GH and GF lines. So, every point on the curved path, E_1 E_2, is a portfolio which is superior or efficient, compared to those lying on the horizontal and vertical lines, passing through that point and on the area enclosed by those lines. So, the E_1 E_2 curved path contains all the efficient portfolios. Hence, it is called the efficient frontier. An investor will choose a portfolio from the efficient frontier. Hence the significance of efficient frontier.

The efficient frontier in the graph 3.1 is smooth. It is always so? Is it continuous? Can it have dents? These are certain questions that emerge. Yes it is continuous. It is smooth. And it cannot have dent or dents.

When innumerable portfolios are constructed it can be shown that efficient frontier is smooth and continuous The efficient frontier cannot have dent. This can be shown by seen what happens if a dent exists and proving the impossibility of such result.

Look at graph 3.2. In the efficient frontier a dent is provided between two points, A and B, both are portfolios lying in the undented frontier. Suppose an investor puts 50% of his funds in portfolio A and rest 50% of his funds in portfolio B and his resulting portfolio (C) will yield a return higher that of portfolio (D) lying in the dented frontier. How is it possible? It is possible if the efficient frontier is truly efficient frontier. So, a dented efficient frontier is impossible to have.

RISK-RETURN INDIFFERENCE CURVE

The efficient portfolios lying on the efficient frontier at the lower range of the curve are portfolios with lower return and lower risk, those lying at the middle range are portfolios with moderate return and moderate risk and those laying at the higher ranger of the curve are portfolios with higher return accompanied by higher risk. What do you understand by this? Sample. As return increases risk too increases and vice versa. In other words risk and return move in the same direction. If you want more return, you have to be prepared to pay the price for the same through added risk. 'No gain without pain' is the

adage that aptly describes the situation. Similarly, as you opt for lower return, you are benefited with lower risk. Risk is the price for return. The more the return you expect, the higher the price, ie., higher risk and vice versa. This relationship between risk and return forces investors settle for a given return assuming the accompanying risk or take certain risk and get the accompanying return. This is what we call as trade-off in risk- question that springs up now. This is addressed below through risk – return preference and risk-return indifference writes.

❖ **Risk-Return Preference**

How much amount of risk you would prefer to take? The answer depends on your risk preference. Though risk and return go hand in hand, not all would uniformly prefer high-return and high risk or low risk and low return. Investors are of different categories. Some want to play safe. They take low risk and are satisfied with low return. There are others who prefer a moderate risk, getting moderate return. The rest take high risk in the hope of making high returns. You would know that low, moderate or high levels refer to some range each, rather than a particular point.

Indifference curves are used to depict risk-return preferences of individuals indifference curves in the context of risk- return preferences may be constructed in this way. You ask an individual to tell several combinations (pairs) of risk-return levels which are equally preferable to him. He may tell the following several pairs:

Pairs	1	2	3	4	5
Return	13	15	17	19	21
Risk	2	2.6	3.3	4.1	5

Hire we can obtain an indifference curve. Pair 1 means 13% return and 2% risk. A certain level of satisfaction results. Pair 2 gives 15% return abd a risk of 2.6%. return is more. But risk is also more. So the investor has same satisfaction as before. Along the curve, as he moves he is equally happy irrespective his position in the curve. You can consider another pattern also as follows:

Pairs	1	2	3	4	5
Return (%)	13	15	17	19	21
Risk (%)	3	3.6	4.3	5.1	6

Here the resulting indifference curve indicates a lower level of satisfaction as risk has moved up. while returns remained the same as we saw in the first case. In the following case returns moved up, risk remaining at oid level. It indicates higher satisfaction.

Pairs	1	2	3	4	5
Return (%)	15	17	19	21	23
Risk (%)	2	2.6	3.3	4.1	5

So. we developed 3 indifference curves for the same individual. eacl representing a particular level if satisfaction.

In the similar way we can develop several indifference curves for the same and other investors. Consider the following 3 indifference curves relating to an individual investor:

i)	return (%)		20	22	24	26	28
	risk (%)	6	6.1	7	7.9	8.5	
ii)	return (%)		20	22	24	26	28
	risk (%)	5	5.1	6	6.9	7.5	
iii)	return	22	24	26	28	30	
	risk (%)	6	6.1	7	7.1	8.5	

The investor concerned prefers a higher risk compared to the one already we saw. And he expects high return.

There may be another with the following indifference levels:

i)	return (%)	28	30	32	34	36
	risk (%)	9	10	10.8	11.4	11.8
ii)	return (%)	28	30	32	34	36
	risk (%)	10	11	11.8	12.4	12.8
iii)	return (%)	31	33	35	38	41
	risk (%)	9	10	10.8	11.4	11.8

This investor goes for still higher risk level with corresponding returns.

The first investor takes less risk and is satisfied with corresponding loss return. The second takes moderate risk and is hoping a moderate return and the third takes high risk and expects high returns. In other words, the first one is called risk-averter (as he is risk avoiding or averse to risk – he takes only less risk). the third may be called risk-seeker or risk-lover, as he takes more risk and the second falls in between. He is an average investor. All if them are represented in the adjoining graph –3, by their respective indifference curves.

Note, the indifference curves are not 'scaled'. These are drawn free hand just to highlight the concept. For each individual investor we have a set of 3 indifference curves IC_1, IC_2, IC_3 indifference curves of an individual never cut each other.

In difference curves of 3 individuals A, B and C are presented in the above graph. A is risk averse, B is moderate and C is risk-seeker. In each of their case IC_1 gives high satisfaction, IC_2 gives moderate satisfaction and IC_3gives the leas of the three. WE can draw more Ics, but we have limited to 3 curves for each. New portfolio selection can be attempted.

PORTFOLIO CHOICE

Once the efficient frontier of portfolios and risk-return indifference curves of individual investors are known, portfolio selection is a matter of simple logic. You have to pick a particular portfolio from the efficient frontier. How to identify the same, is the question. That portfolio which is at the point of tangent of the efficient frontier curve and any of the ICs of an individual investor. is the choice portfolio for that investor. Point of tangent means, the touching points not cutting point.

There are two versions at this stage of analysis, viz, efficient frontier consisting of risky investments only and efficient frontier consisting both risky and risk free investments. We shall consider both.

❖ Efficient Frontier: All Risk investments:

Each of the individual securities / investments / assets, that we picked to construct portfolios has an element risk, however small that may be. Then, the efficient frontier would be a curve as we have seen already.

The choice portfolio is given by the tangential point of the efficient frontier any of the ICs.

Look at the graph –4, EOPF is the efficient frontier. Investor A's ICs are in the lower range and B's in the higher range. At point 'O' on EOPE, IC_2 is tangential to EOPF. So, portfolio represented by point 'O' is the choice for A. Similarly for B, the choice is 'P'.

In the case of both the investors, IC_1 gives more satisfaction. But this lies outside the efficient frontier. IC_1 is beyond the attainable set. IC_3 implies least satisfaction. A better position than that is available. IC_2 of both investors is tangential with the frontier at points 'O' and 'P' respectively. So, 'O' for A and 'P' for B becomes the choice portfolios.

❖ Efficient Frontier: Both Risk and Risk – Free securities included in the portfolio

Portfolios can be constructed and are generally constructed by combining both risky and risk-free securities. Risk free securities are

government or quasi government bonds. bank deposits and the like. You are sure of getting the contractual rate of interest. Similarly, corporate bonds and public deposits both with highest credit ratings. the 'AAA' category, are also risk free as you are 100% sure of getting interest and principal back. But the returns are less in these risk-free securities – you get in the range of 12% p.a.

When you construct portfolios mixing risky and risk free securities your efficient frontier is different from the one we dealt earlier. And this is given by, the straight line originating from the risk-free rate of return on the 'X' axis and passing tangential to the efficient frontier of risky portfolios at point M. Look at the graph 5 given here. EMF is the efficient frontier of risky portfolios 'C' is the risk-free rate of return. From C a straight line tangential to EMF is drawn. The tangential point is M. CML is the efficient frontier of portfolios which include risk-free investments also. CML is referred to as capital market line.

Every point on CML, except M gives more return than every point on EMF. except M. for the same level of risk. Take P_1 & P_2. representing two different portfolios, having the same risk level. But return on P_2 is more than return on P_1. Similarly, every portfolio on CML, except M gives same return for a lower risk, as against every portfolio on EMF, except M. P_3 gives same rate as P_1. for a lower risk. Portfolio 'M' is common to both EMF and CML. So. CML dominates. EMF at all. but point M. Portfolio 'M' is called the market portfolio.

Investors put a part of their investible fund in 'M' and rest in 'C'. A risk averse person would put more of his investible fund in 'C' and a small portion in 'M'. A moderate risk taker would put all or almost all of his money in 'M'.

A risk seeker would put all his money in M. besides he would borrow at the risk-free rate of return and put that borrowed money also in portfolio M.

The return obtained by risk-averse investor would be more than risk-free rate but less than return on the market portfolio, M. A moderate risk preferor's return would be more or less equal to the return of the portfolio M. A risk-take would earn more than the return of the portfolio M.

Consider the example:

	Investor – A	Investor – B	Investor – C
Investible fund (own)	Rs.1,00,000	Rs.1,00,000	Rs.1,00,000
Risk free rate	12%	12%	12%
Market return	18%	18%	18%
-risk-free investment	Rs. 60,000	0	- 60,000
- portfolio M	Rs. 40,000	Rs.1,00,000	Rs.1,60,000

The return earned by A $= \frac{60000}{100000} \times 12\% + \frac{40000}{100000} \times 18\% = 14.4\%$

The return earned by A $= \frac{100000}{100000} \times 18\% = 18\%$

The return earned by C $= \frac{160000 \times 18\%}{100000} - \frac{60000 \times 12\%}{100000} = 21.6\%$

('C' borrows Rs.60000 @ 12% p.a., the risk free rate, and invests Rs.1,60,000, including his own sum Rs.1,00,000 in portfolio M yielding 18% p.a. His net return is, therefore total return from 'M' less cost of borrowing).

Right now shall we take a turn to find how portfolio choice is made with the inclusion of risk free securities? Yes, Again we are going to use the indifference curve technique. The portfolio choice is made in the usual way. The capital market line, is the choice portfolio for that investor. Look at the following graph-6.

Investor 'A' is risk averse. He opts for a low risk portfolio, P lying between M and C. He puts a part of his money in risk-free investment and the balance in M. He eventually gets a return of OP1 risk. Actually the money he invested in risk-free securities is a 'lending' rather than an investment. His portfolio is therefore referred to as 'lending portfolio. Any portfolio that lies in the CM segment of CML are lending portfolios, as a part of the investible fund is 'lent' at risk-free rate of return.

As against this another investor might borrow at risk free rate of return and invest in 'M'. so, his portfolio lies on the CML beyond portfolio M. His portfolio is called 'borrowing portfolio'. In fact all portfolios lying beyond M. on CML are 'borrowing portfolios'. Investor 'C' has adopted the technique of borrowing lower rate of interest and investing the sum at higher rate of return. ie., in portfolio M. His portfolio lies beyond M and on the CML, hence his is a 'leveraged portfolio'. His return is QQ and risk is QQ_1.

Investor 'B' has put all his money in portfolio M. viz., the market portfolio Market portfolio means a portfolio that represents a portfolio of all securities available in the market. weighted by their respective total market value. Market portfolio dominates all portfolios in the opportunity set.

If borrowing is not permitted. the efficient frontier would be CMF. ie.. beyond M. the curved portion becomes part of the efficient frontier. Then tangential point along CMF has to be found to locate the choice portfolio.

If the investor's borrowing rate is higher than his lending rate. a different picture would emerge. Look graph given in chart 7. Here the investor's borrowing rate is B1. which is greater than his lending rate L_1. If he is risk averse investor. he would go for a lending portfolio. which would lie on the L_1-L segment, L_1 is the risk-free rate of return and L is the risky portfolio common to both L_1-L-L_2 and efficient frontier of risky securities viz.. EMF. If the investor is a risk-taker he would borrow and invest. but he can borrow only at a high rate than the risk-free rate. His borrowing rate is B_1. His portfolio would lie on the B-B_2 segment of B_1-B-B_2. You would now realise that. the risk-seeking investor's net return is slightly reduced. because of the high rate of borrowing. When borrowing at C is presented return is OP. But when it is done at C_1. the return is reduced to OP_1.

Again the particular portfolio of choice would be determined by the tangential point of ICs with the respective segment of the efficient frontier. viz.. L_1L in the case of risk-averse inverse investor and B-B_2 in the case of risk-seeking investor.

If the market portfolio. M lies between points L and B. we can draw a line tangential at point M to the Emf curve. which would intercept at point 'C' on the return axis. This represented by the dashed lines. Then 'C' represents. a zero beta portfolio, a portfolio with negligible variation in return.

❖ CAPITAL MARKET LINE

The location of the 'market portfolio' is given by the point of tangent of the efficient frontier of all risky security portfolios with the straight line with origin from the risk-free rate of return. Investors want to take advantage of the risk-free and risky securities. Investment at risk-free return and the 'M' which includes all risky securities in the market in the proportion of their individual total market value to total value of all securities in the market meets the investor's needs. If any security is not in the 'M'. its price will fall. Subsequently its price earnings ration declines to justify its inclusion in the market portfolio. Thus 'M' is a representative of all risky securities.

The slope of the CML is an important parameter. And this is equal to $(R_m - r) / S_m$. where R_m is mean market portfolio return. 'r' is risk free return and S_m is standard deviation of return of the market portfolio.

The relationship between return and risk of efficient portfolio is given by:

$$R_j = r + \frac{R_m - r}{S_m} \times S_j$$

R mean return on jth portfolio:

S = standard deviation of jth portfolio.

The return on any portfolio thus comprises of two components: (i) risk free rate of return and (ii) risk premium. Risk premium is reward for risk, which is equal to price of unit risk times quantity of risk taken. Price of unit risk is given by.

$(R_m - r) / S_m$ and quantity of risk by S_j

❖ SECURITY MARKET LINE

The relationship between risk and return of an inefficient portfolio or a single security is expressed by the security market line (SML). SML's slope is: $(R_m - r)\ S^2_m$, where S^2_m is the variance of the returns of the market portfolio and its intercept is: r-the risk free rate of return.

The required return for the inefficient portfolio or any single security is given by:

$$R_i = r + \frac{(R_m - r)}{S^2_m} \times C_{i,m}$$

$$= r + (R_m - r) \times \frac{C_{i,m}}{S^2_m}$$

$= r + (R_m - r)\ B_i$ since $C_{i,m} / S^2_m = B_i$

B_i is the beta coefficient of risk of ith security.

Since market beta, $B_m = 1$, price of unit risk under this measure = $(R_m - r)/1 = R_m - r$

Risk premium = Price of risk x risk = $(R_m - r)(B_i)$

Illustration - 1

Let $R_m = 22\%$; $r = 12\%$, risk of efficient portfolio $j = 5\%$. Calculate expected return for the portfolio j, given $S_m = 4\%$.

Return of efficient portfolio, J

$$R_j = r + \frac{R_m - r}{S_m} \times S_j$$

$$= 12\% + \frac{22\% - 12\%}{4\%} \times 5\%$$

$$= 12\% + (2.5 \times 5\%) = 24.5\%.$$

Illustration - 2

$R_m = 22\%$; $r = 12\%$; $r_{i,m} = .8$; $= S_m = 5\%$; $S_i = 4\%$. Find the expected return for the ith security.

Expected return for ith security.

$$R_i = r + \frac{R_m - r}{S^2_m} \times r_{im} \times S_m \times S_i$$

$$= 12\% + \frac{22\% - 12\%}{5\% \times 5\%} \times .8 \times 5\% \times 4\%$$

$$= 12\% + 10\% \,(16/25) = 18.4\%.$$

Illustration - 3

$R_m = 22\%$: $r=12\%$: $B_i = 1.5$. Find the expected return on security i.

$$R_i = r + (R_m - r)\,B_i = 12\% + (22\% - 12\%)\,1.5$$
$$= 12\% + 15\% = 27\%$$

Lagrange multipliers Technique to spot the efficient or dominant portfolio

Efficient or dominant portfolio is one that results in a target return for the least risk. In the Markowitz approach to portfolio construction. all possible portfolios have to be constructed first and then efficient portfolios picked out. But constructing such opportunity set of portfolios is time consuming process. Is there a way out? Yes. Lagrange Multipliers Technique helps finding the efficient portfolio given the required return. Given the target return. which portfolio (i.e.. proportion of different assets) will yield this return and yet involve least risk can be found out.

Lagrangian Process is explained by taking a 3 assets portfolio.

Let the return. risk and correlation coefficients of returns between the different pairs of assets be as under.

Returns and risk figures

Assets	Return (%)	Risk
1	14	6% or 0.06
2	18	7% or 0.07
3	22	8% or 0.09

Given $r_{1,2}$ = .8, $r_{1,3}$ = .42; $r_{3,2}$ = .2. The variance (S_2) and Covariance (S_i S_j r_{ij}) matrix as:

	1	2	3
1	.004	.003	.002
2	.003	.005	.001
3	.002	.001	.008

Let x_1, x_2 and x_3 be the weight of the 1st, 2nd and 3rd asset in the portfolio Then,

$x_1 + x_2 + x_3 = 1$

Let our target portfolio return (T_{pr}) be 19%. Our task is finding the values of W_1, W_2 and W_3 such that portfolio return is 19%, but risk is the least. We use Lagrangian process here.

(i) The portfolio return equation is

r_p = .14x1 + .18x2 + .22 (1-x-x2). Setting this as equal to ·19% or .19, we get $T_{pr} - r_p$ = .08x1 + .04 x 2 - .03 = 0.

(ii) The portfolio variance amounts to:

$S^2_P \quad = \quad .004x^2_1 + .005x^2_2 + .00(1-x_1-x_2) + 2x\ .003\ x\ x_1\ x\ x_2\ +$

$$2 \times (.002) \times (x_1)(1-x_1-x_2) + 2x(.001) \times (x_2)(1-x_1-x_2).$$

$$= \quad .004x^2_1 + .005x^2_2 + .008 + .008x^2_1 + 008x^2_2 - .016\, x_1$$
$$+ .016\, x_1x_2 - .016\, x_2 + .006\, x_1\, x_2 + .004\, x_1 - .004x^2_1$$

$$= \quad .008x^2_1 + .011x^2_2 - .012\, x_1 - .014x_2 + .016\, x_1x_2 + .008.$$

We have to minimise S^2_p subject to target return condition. So, our objective function as per Lagrangian Process is:

$$\text{Minimize } Z = S^2_p + L\,[T_{pr} - r_p],$$

where L. Lamda. is Lagrangian Multiple.

That is Minimize $Z = \quad .008x^2_1 + .011x^2_2 - .014x_2$

$$+ .016x_1x_2 + .008 + L(.08x_1 + .04x_2 - 0.3)$$

When we minimize Z, the Lagrangian Multiplier will ensure return constraint is always satisfied.

Using partial differentiation. Values of $x_1.x_2$ and L for which Z will be minimum can be found. The same is done below:

$$\frac{dz}{dx_1} = \quad .016x_1 + .016x_2 + .081 - .012 = 0 \qquad -(1)$$

$$\frac{dz}{dx_2} = .016x_1 + .022x_2 + .04L - .014 = 0 \qquad -(2)$$

$$\frac{dz}{dL} = .08x_1 + .04x_2 + L - .03 = 0 \qquad -(3)$$

We have to simultaneously solve these three equations to get the values of x_1, x_2 and L.

Eqn (1) x 1 gives $0.16x_1 + 0.16x_2 + .08L$	$= .012$	-(4)
Eqn (2) x 2 gives $.032x_1 + .044x_2 + .08L$	$= .028$	-(5)
Eqn (4) – (5) gives $.016x_1 - .028x_2$	$= -.016$	-(6)
Eqn (3) x 0.2 gives $.016x_1 + .008x_2$	$= .006$	-(7)
Eqn (6) + (7) gives $.02x_2$	$= -.010t$	
So, x_2	$= 0.5$	

Putting the value of $x_2 = 0.5$ in equation, 3 to get,

$.08x_1 + .04(.5) = 0.03$ or

$.08x_1 = 0.01$ or

$x_1 = 0.125$

$$x_3 = 1 - 0.125 - .5 - 0.375$$

And. L – 0.025

The portfolio variance will be = 0.003375 or 33.75 percentage squared. So, portfolio std. deviation = 5.8%. So, to get a target return of 19%. investment in the 3 securities should be in the order of 12.5%. 50% and 37.5%. And this will result in a portfolio minimum std. deviation 5.8%.

The value of L = 0.025 and this refers to incremental rate of change in the value of objective function, namely portfolio variance resulting from small change in the constraint, viz., the target return.

FACTOR MODELS

In portfolio management computation of expected return, risk and covariance for every security included in the portfolio is crucial process and it proves a bit difficult too. Factor models relatively make the process easier as security return is assumed to be in correlation with one factor(s) or other(s). Factor models captured macro economic factors that systematically influence prices of securities. Any aspect of a security s return unexplained by the factor model is taken as security specific.

Factor models are otherwise known as index models. Security return when assumed to be related to return on a market index, such model is called as market index model. Similar to return on market index, other factors to which security returns stand related can be modeled and used to estimate returns of securities. Similarly portfolio returns as related to identified factors can be found and used in portfolio management. And this will ease the problem of computing returns, variances, etc., in the Markowitz approach to portfolio management. In fact Markowitz student willian Sharpe developed the factor

model concept to ease the computational complexities of Markowitz Process of getting efficient set.

One factor (say Market Return, Growth rate of Gross Domestic Product, Prime Lending Rate (PLR) or Inflation rate), two factors (any two of macro economic factors) and multi-factors models can be through of. Here we are concerned with one-factor and two-factor models only.

❖ One-Factor Model

Let us assume that return on a security is related to a macro-economic factor, viz., growth rate of GDP. Then the return of the security can be given by the equation.

$r_t = a + b\ GDP_1 + e_t$ where,

r_t = the return of the security for period 't'

GDP_t = the predicted rate of growth of GDP for period 't'

e_t = the unique or specific return of the security in period.

't' (that part of return not related to GDP)

b = sensitivity of the security to GDP growth rate

a = return of the security when GDP growth is zero or the zero factor for GDP

Graph 8 gives a picture of the one factor model, the factor being GDP.

The security's return is found to be regressed to GDP growth as Y = a+bx or Y = 4 + 2x. So, a = 4%; b = 2. When x = 4, the expected value of Y will be: 4% + 2(4)% = 4% + 8% = 12%. However, if Y stood at, say 13%, then et becomes equal to 1%, a = 4% and b GDP_t = 8%.

Security Return, Risk and Covariance in One-factor model

Expected return of security i, according to one-factor model can be written as:

$r_i = a_i + b_i F$, where F is the expected value of the factor. If we expect GDP to grow at 3.5%, then security return will be 4% + 2(3.5%) = 11%.

Variance of return of security 'i', according to one factor model is given by:

$S^2_i = b^2_i S^2_F + S^2_{ei}$, where,

S^2_F = variance of the factor F

S^2_{ei} = Variance of the random error term for security 'i'.

If we take, $S^2_F = 4.8$ and $S^2_{ei} = 9.8$, then

$S^2_i = 22 (4.8) + 9.8 = 19.2 + 9.8 = 29$.

Covariance between any two securities is given by: $S_{ij} = b_i b_j S^2_F$.

Tangency Portfolio Under One-factor model

By estimating a_i b_i and S_{ei} for each of the 'N' risky securities to be included in the portfolio, and by ascertaining expected value of the factor, F, and its std. deviation, expected returns, variances and covariances of all the 'N' securities can be calculated.

Using these values the curved efficient set of portfolios can be derived. And the tangency portfolio can be sorted for the given risk-free rate then portfolio choice can be exercised through risk-return indifference curves and the emerging CML.

And the variance of the portfolio is given by:

$S^2_P = b^2_P S^2_F + S^2_{ep}$ where,

b_P = Summ. $W_i b_i$ (w_i – w_i of the ith security and b_i – sensitivity of the ith security for the factor) and

S^2_{ep} = Summ $w^2_i S^2_{ei}$ (S^2_{ei} (S^2_{ei} – variance of error term of the ith security).

$b^2_P S^2_F$ is known as factor risk factor risk and S^2_{ep} is called as non-factor risk. As diversification takes place, the non-factor risk reduces or risk due to peculiar features of securities in the portfolio gets reduced.

Portfolio return = Summ. $x_i r_i$

Portfolio variance = $b^2_{1P} S^2_{F1} + b^2_{2P} S^2_{F2}$

$+ 2b_{1P} b_{2P}$ Cov $(F_1, F_2) + S^2_{ep}$, Where

S^2_{ep} = Summ $X^2_i S^2_{ei}$

Illustration - 4

Two securities have the following futures

Security	a_i	b_i	e_j	S_{ei}
	1	7	1.5	2.8
	2	5	2.0	6.2

The two securities are sensitive are sensitive to GDP growth rate and GDP has a mean of 6 an Std. deviation of 3. Find the return, risk and covariances of he securities / portfolio with 60% and 40% composition.

Solution

Security return $= r_i + b_iF + e_i$

So, $r_1 = a_1 + b_1F + e_1$

$= 7 + 1.5(6) + 1.2 = 17.2.$

$r_2 = a_2 + b_2F + e_2$

$= 5 + 2(6) + 2.5 = 19.5.$

Security variance $= S_i^2 = bi^2S_F^2 + S_{ei}^2$

$S_1^2 = (1.5)^2 (3)^2 + (2.8)^2 = 28.09$

$S_2^2 = (2)^2 (3)^2 + (6.2)^2 = 74.44$

Covariance $= S_{i,j} = b_ib_j S_F^2$

$S_{1.2} = (1.5)(2)(3)^2 = 27$

Portfolio return $=$ Summ. $W_i R_i$

$= .6(17.2) + .4(19.5) = 18.12.$

Portfolio variance $= S_P^2 = b_P^2 S_F^2 + S_{ep}^2$

$b_p = b_1.W_1 + b_2.W_2 = 1.5(1.6) + 2(.4) = 1.7$

$S^2_{ep} =$ Summ $W^2_iS^2_{wi}$

$= (.6)(.6)(2.8)(2.8) + (.4)(.4)(6.2)(6.2)$

$= 2.82 + 6.15 = 8.97$

❖ Two Factor Model

Here two factors are said to be influencing security returns. Let GDP and PLR are the two factors.

Security Return, Risk and Covariance

Return r_i = $a_i + b_{i1}F_1 + b_{i2} + e_i$

= $a + b_i \, GDP + b_i \, PLR + e_i$

Expected Return r_i = $a_i + b_{i1}F_1 + b_{i2}F_2$

= $a + b_i \, GDP + b_i \, PLR$

Variance = $S^2_i + b^2_{i1}S^2F_1 + b^2_{i2}S^2F_2 + 2b_{i1}b_{i2}COV(F_1.F_2) + S^2_{ei}$

<u>Covariance between any two securities</u>

$S_{ij} = b_{i1}b_{j1}S^2F_1 + b_i^2 \, b_j2S^2F_2 + (b_{i1}b_{i2} + b_{i2}b_{i1}) \, (COV(F_1.F_2)$

Tangency Portfolio Under Two-Factor Model

Once the expected returns. variances and covariances securities are estimated, efficient set of portfolios can be derived. Given the efficient frontier and risk free rate of return, tangency portfolio can be identified.

Then portfolio choice can just like that be exercised through risk-return indifference curves of the individual investors and the emerging CML.

Questions

1. Explain Markowitz process of portfolio construction and its difficulties.
2. Explain opportunity and efficient sets of portfolios.
3. Discuss the features and uses of risk-return indifference curves.
4. Explain the Lagrangian Multiplier Method of identifying the efficient portfolio.
5. Explain single factor and two factor models.
6. What are the merits of factor models.
7. Risk free is 12%; Return on market portfolio is 17% and std. diviation of market portfolio is 5% what is the equilibrium return for a portfolio risk is 10%? What will be return for an investor who puts 50% in risk free asset and balance in market portfolio? What is the return for an investor who borrows a sum equal to his own fund at risk-free rate and invests both borrowed and own funds in market portfolio.
8. Given are returns and std. deviation of 3 securities and their variances and covariances.

Scrips	Monthly returns	Std. deviation
1	3.5%	11%
2	9.0	20%
3	4.5	12%

Variances and Covariances

	1	2	3
1	0.012	0.009	0.007
2	0.009	0.004	0.014

3	0.007	0.014	0.014

If the target return is 5% find the portfolio with minimum risk using langrangian process.

9. Three securities have the following features:

Securities	a_i	b_i	c_i	S_{ei}
1	4	1.8	3.8	12.2
2	3	2.2	4.2	6.9
3	5	1.7	5.1	7.8

The securities are sensitive to industrial production and growth rate in industrial production is 8% with std. deviation 4. Find the return, variance and covariance of securities and return and risk of the portfolio comprising 20% of 1, 50% of 2 and 30% of security 3.

LESSON – 6

CAPITAL ASSET PRICING MODEL

Security analysis refers to the analysis of trading in securities from the point of view of their prices, returns and risks. This will help in understanding behaviour of security prices and the market that help in investment decision-making. Securities represent a spectrum of risks ranging from virtually risk-free debt securities to highly speculative bonds, common stocks and warrants. The investor has to make a trader-off between risk and return by asking different questions in the light of market behaviour, as to the mix or composition of portfolio. Risk and return are inseparable. The investor should try to keep the risk associated with the return proportional. Return is the monetary benefit in the form of dividend/interest earned and capital gains made.

RISK ANALYSIS

Risk refers to the volatility or fluctuation in returns. Risk describes the quality of return - its certainty or otherwise. Given a time series data on the return of a security, its expected (ie. mean) return and its risk can be computed. Risk is measured by the dispersion or variability in return from the mean or expected return. Generally, standard deviation of return on investment is taken as the measure of risk, though other measures of dispersion, like quartile deviation, mean deviation, range and co-efficient of variation may also be used.

Say the return on a security over a period of 10 years was as follows: 10%, 12%, 18%, 5%, 12%, 19%, 25%, 30%, 20% and 7%. The standard

deviation of return based on historical return data works out to about 7.4%. This is a measure of risk.

Risk of security can be worked out from probability distribution of future earnings. Say the probability distribution of return on a security is:

Return (Ri)	15%	20%	25%
Probability (Pi)	2	4	4

The standard deviation works out to 3.75% given by the formula:
$(Pi(Ri-R)^{2})^{1/2}$ where R is the expected return, which is equal to 21% here.
(ie. 0.2 x 15% + 0.4 x 20% + 0.4 x 25% = 21%)

Risk can be measured through 'beta' co-efficient. Hence the variability of returns of a security relative to variability of return of the market as a whole is worked out.

$$\text{Beta} = \frac{\text{Covariance between return of an individual Security and that of market} = (Ri-Ri)(Rm-Rm)/n}{\text{Variance of the return of market} = (Rm-Rm)2/n}$$

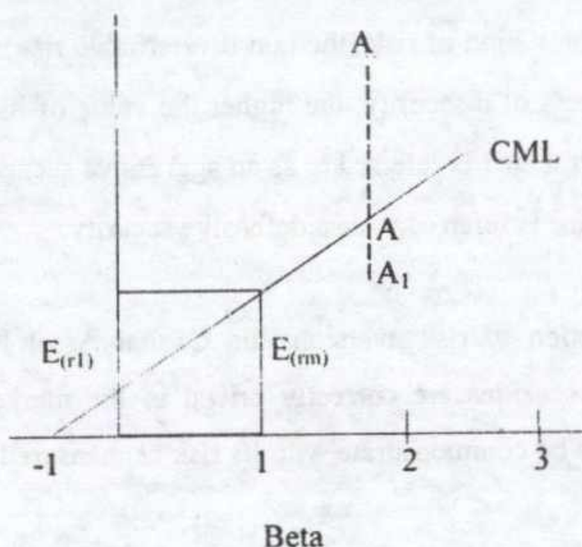
▯ VARIOUS TYPES OF RISKS

Risk are of several types. These are: Interest rate risk, Callability risk convertibility risk, default risk, management risk, liquidity risk, market risk purchasing power risk, political risk and exchange rate risk. Each type of risk has diversifiable and undiversiable components. All risks when aggregated, we get the total risk of an investment security.

Diversifiable Risk is that part of total risk which can be reduced (investors prefer to reduce risk) by investing in a plural number of securities. Assume that company A's share yields good returns when there is a good monsoon and B's share yields well when there is a drought. When one invests one's fund in part in both the shares. whether or not there is good monsoon or drought one is sue of a moderate. stable return. But. when one puts all fund in either A or B, one's return will fluctuate. Don't pull all eggs in one basket. thus, is the logic. Diversifiable risk is also knows as unsystematic risk and it stem from factors specific to particular firms or industries. Difficulty in entering certain markets. plant break down. strife in relationship between management and employees etc. are some firm/industry – specific factors causing risk.

Undiversifiable Risk is that which cannot be reduced even with diversification. Undiversifiable risk affects uniformly all industries. all firms and all investment avenues. This risk is also known as systematic risk and system from macro-level factors like inflation, political factors. internal unstability economic systems adopted. public spending etc. Of course. these factors affect all firms though not uniformly. The systematic risk is borne by all investors, while shrewd investors avoid unsystematic risk through planned diversification. In diagram risk diversification is explained pictorially.

CAPM Graph



Meaning of Beta (β)

We may therefore define the riskiness of a security as its vulnerability to market risk. This vulnerability is measured by the sensitivity of the return of the security vis-à-vis the market return and is denoted by the Greek letter Beta (β). A β of 2 implies that if the market return increases or decreases by 10% over a period, the security return is expected to increase or decrease respectively by 20%. Thus in this case the security return on an average moves twice as much as the market return. A β of 0.5 on the other hand implies that the security return moves only half as much as the market does. The market portfolio which refers to the portfolio consisting of all securities in the stock exchange has a β of 1, since such a portfolio behaves like the market index and moves in line with it. Thus, a share price index represent as it does the market portfolio with a β close to1, is always used as a surrogate for the market

portfolio. A β of zero characterizes a risk-free security like a government bond whose return is almost insensitive to the market return.

Thus β measures the only kind of risk (the non diversifiable risk) which matters; the higher the riskiness of a security, the higher the value of its β. A security with a β value greater than 1 is referred to as an aggressive security and one with a β value less than one is referred to as a defensive security.

Based on the assumption of risk aversion, the Capital Asset Pricing Model believes that if the securities are correctly priced in the market, the return on each security would be commensurate with its risk as measured by its β.

The β of a portfolio is nothing but the weighted average of the β's of the securities that constitute the portfolio, the weights being the proportions of investments in the respective securities. For example, if the β of security X is 1.5 and that of security Y is 0.9 and we hold a proportion of 70% and 30%of the two securities respectively, the β of the portfolio will be 1.32 (1.5 x 0.7+0.9x0.3).

CAPITAL ASSET PRICING MODEL

Capital market theory is an extension of the Portfolio theory of Markowitz. The portfolio theory explains how rational investors should buld efficient portfolio based on their risk-return preferences. Capital Market Asset Pricing Model (CAPM) incorporates a relationship, explaining how assets should be priced in the capital market. The capital market theory uses the

results of capital market theory to derive the relationship between the expected returns and systematic risk of individual securities and portfolios.

Commencing from the mean-variance framework of Markovitz, the Capital Asset Pricing Model is a robust theory which explains how the market values capital assets such as securities.

The model was developed and modified by the works of many financial economists through the sixties significant among them being two Nobel laureates, J.Tobin and W.Sharpe.

In its essence, CAPM holds the capital market compensates only for the unavoidable or systematic risk, since it cannot be diversified away. On the other hand, the market does not compensate for the avoidable risk, since this risk can easily be reduced to a large extent through diversification.

Thus, the most significant statement of the CAPM concerning the riskiness of securities is that "the riskiness of a security when held in isolation is irrelevant what is relevant is the security's contribution to the risk of the portfolio as a whole". The market's compensation for the systematic or unavoidable risk under the CAPM is governed by the following equation.

$$E(Rs) = rf + \beta[Rm) - rf]$$

where,

E(Rs) = Expected Return on Security s per period

E(Rm)= Expected Return on the market portfolio per period

rf	=	Return on a riskfree security, say a government bond, per period
β	=	An index for systematic or unavoidable risk called β

Thus, the quantity (Rm – rf) is the risk premium which an investor can expect to earn in proportion to the level of unavoidable risk level of β assumed by him. If one invests in a security which is riskfree and hence by definition has a β of zero, one's expected return remains just r, ie. there will be not risk premium earned, since there was no risk taken.

Assuming the value of rf and E(Rm) to be 11% and 20% respectively in the Capital Asset Pricing Equation presented above, an investor investing in a risky security with a β of 2 can hope to earn a return of about 29% (11+2x(20-11)=11+18 = 29). In other words, 18% is the risk premium which an investor investing in a security with a β of 2 can hope to earn over and above the riskfreee rate of 80% as a reward for the risk undertaken by him in investing in the security. Similarly, the expected return on a security with a β of 0.5 will be about 15.5%(11+0.5x(20-11) = 15.5), implying thereby a risk premium of only 4.5%.

Since a well diversified portfolio of risky securities has a β of about 1, we may appoint or total investment between riskfree investment and this portfolio in a desired mix. Such a mix would typically yield an overall β less than 1. For example, if we invest 50% of our money in a zero (or near zero) β security, and 50% in a well diversified portfolio, the overall β of our investment will be 0.5 (0.5 x 1 + 0.5 x 0). Similarly, we could borrow an amount equal to

25% of our own money and invest the total (125%) in the market portfolio. This would yield us a β of 1.25 [(1.25 x 1) – (0.25 x 0)] for our overall investment. Thus, depending upon our desired risk level, we could obtain any level of β for our portfolio by appropriately lending a fraction of our money and investing the balance in the market portfolio, or borrowing some money and investing the same together with our own money in the market portfolio.

Strictly speaking, CAPM can be applied in the context of all capital assets, such as securities, real estate, bullion, antiques, and so on, though mostly it is used in the context of securities only. We realise of course that just as we talk of diversifying our investment over several securities, we could also talk of diversifying our investment over various kinds of assets, to spread the risk further. However, investments in real estate, bullion, antiques etc. are again slippery fields in their own right, requiring expert skaters to negotiate the terrain, and we will do well to stick to our securities for the time being.

Assumptions Underlying the CAPM

The CAPM is based on several assumptions about investors and the market.

Investors are assumed to take into account only two parameters of return distribution, namely the mean and the variance, in making a choice of portfolio. In other words, it is assumed that a security can be completely represented in terms of its expected return and variance and that investors behave as if a security were a commodity with two attributes, namely, expected return which is a desirable attribute and variance which is an undesirable attribute. Investors

are supposed to be **risk averse** and for every additional unit of risk they take, thev demand a compensation in terms of expected return.

Again, the capital market is assumed to be efficient. And **efficient market** implies that all new information which could possibly affect the share prices becomes available to all the investors quickly and more or less simultaneously. Thus in an efficient market no singly investor has an edge over another in terms of the information possessed by him since all investors are supposedly well informed and rational, meaning that all of them process the available information more or less alike. And finally, in an efficient market, all investors are price takers, ie. no investor is so big as to affect the price of a security significantly by virtue of his very trading in that security.

CAPM also assumes that the difference between lending and borrowing rates are negligibly small for investors. Also, the investors are assumed to make a single period investment decisions. The cost of transactions and information are assumed to be negligibly small. The model also ignores the existence of the which may influence the investors' behaviour.

The fact that some of the above assumptions are somewhat restrictive has attracted considerable criticism for the model. This, however, need not distract us from the main thrust of the model. CAPM merely implies that in a reasonably well functioning market where a large number of knowledgeable financial analysts operate, securities will yield returns consistent with their risk. Since if this were operate, securities will yield returns consistent with their risk. Since if this were not so, the knowledgeable analysts will be able to take advantage of the opportunities for disproportionate returns and thereby reduce

such opportunities. Hence, according to CAPM, in an efficient market, returns disproportionate to risk are difficult to come by.

Estimating the Rate of Return from a Security using the CAPM

When we have the value of β of a security, the risk-free rate of return(r) and the average value of market return [E(Rm)] it is a relatively simple matter to plug these values in the Capital Asset Pricing Equation to obtain the expected return from a security.

The Capital Asset Pricing Model is thus a study of risk and return. Given the risk of an efficient portfolio what should be the ideal return for the same is being studies in CAPM. As diversifiable risk can be diversified, here the undiversiable risk alone is considered. The assumption of CAPM are summarised in a capsular form for easy review:

i. There are risk less investments in the market and investors can lend or borrow at this rate.
ii. Investors have homogeneous – expectations as to risk and return.
iii. Investors are risk averse.
iv. Investors have the same planning.
v. Transactions costs are nil.
vi. Short selling and long buying are possible without any limit.
vii. Investments can be made in infinite small quantities also, and
viii. There is perfect competition.

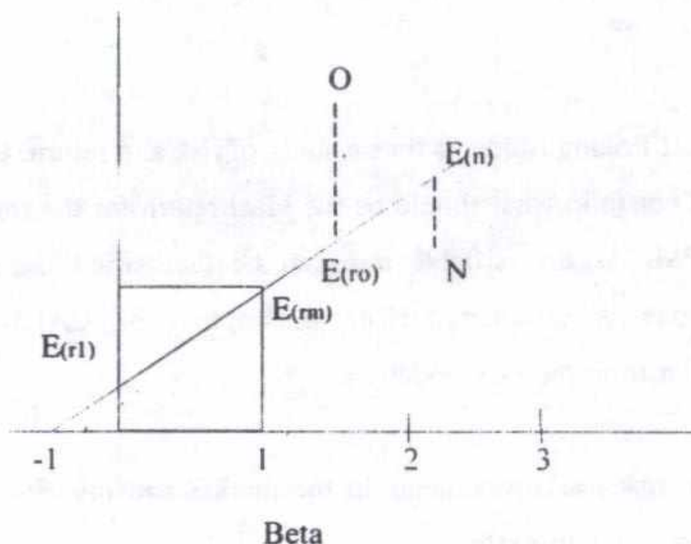
The expected return of a portfolio is given by
$E_{(n)}$ $= R + (E_{(rm)} - R)\, b$, where,
r_1 - is the expected return on ith portfolio

R - is the risk free rate of return

b_1 - is the beta of the ith portfolio

r_m - is the return of the market portfolio (market portfolio is a representative whole of all securities traded)

Security Market Line under CAPM



The x-axis gives beta. Beta value normally moves in the plus or minus 2 range. The beta of a market portfolio is equal to 1. Therefore, expected return, for beta = 1, is the expected market return or $E(r_m)$. Higher the beta of a portfolio (beta of a portfolio is simply the weighted average of beta of individual securities in the portfolio), higher the expected return. Negative beta indicates the return of the portfolio moves in opposite direction of the return of the market portfolio.

The expected return E(ri) for a portfolio comprises of two components, viz. the risk-free return = R, and risk premium. Risk premium is equal to excess of market return over risk-free times risk in beta measure. So, higher the risk, higher is the expected return on the portfolio and vice versa.

Portfolio 'A' is exactly on the CAPM. This means the expected return of the portfolio is equal to actual return. That is the portfolio is correctly priced. A_1 portfolio is vertically below 'A', which means, A1 gives low return though its risk is equal to A. In other words, A_1 is overpriced. On the other hand A_2 is vertically above A_1 but riskwise both are similarly placed. In effect A_2 is under priced.

In a perfect competition, A_1 and A_2 cannot continue to get exist for long. As A_2 is giving more return investor will go for it increasing its price and will dispose of A_1 as it is overpriced. In effect, A_1's price will fall and A_2's price will rise and both will reach balance when they settle at 'A'.

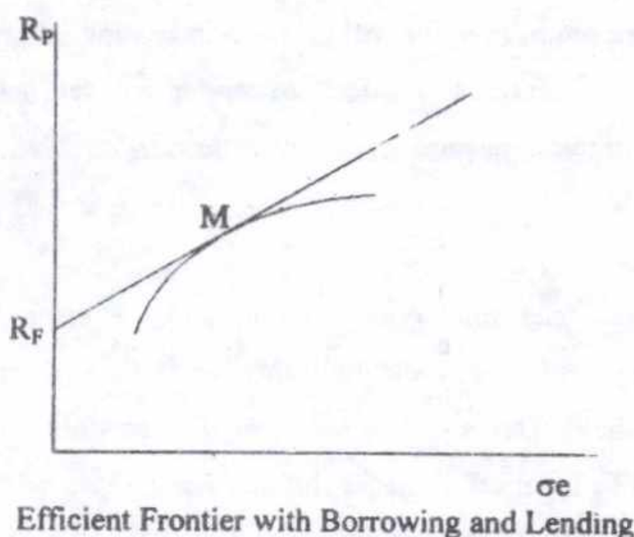
Capital Market Line

If all investors face similar expectations and the same lending and borrowing rate, they will face a diagram such as that in Diagram 3 and, furthermore, all of the diagrams will be identical. The portfolio of assets held by any investor will be identical to the portfolio of risky assets held by an other investor. If all investors hold the same risky portfolio, then, in equilibrium, it must be the market portfolio(M). the market portfolio is a portfolio comprised of all risky assets. Each asset will be held in the proportion that the market value of the asset represents to the total market value of all risky assets. All

investors will hold combinations of only two portfolios, the market portfolio and a riskless security.

The straight line depicted in Diagram 3 is referred to as the Capital Market Line (CML). All investors will end up with portfolios somewhere along the CML and all efficient portfolios would lie along the CML. However, not all securities or portfolios lie along the CML. From the derivation of the efficient frontier we know that all portfolios, expect those that are efficient, lie below the CML.

Capital Market Line Under CAPM



Efficient Frontier with Borrowing and Lending

Observing the CML tells us something about the market price of risk. The equation of the CML (connecting the riskless asset with a risky portfolio) is:

$$R_e = \frac{R_F + R_M - R_F}{\sigma M} \sigma e$$

where the subscript e denotes an efficient portfolio.

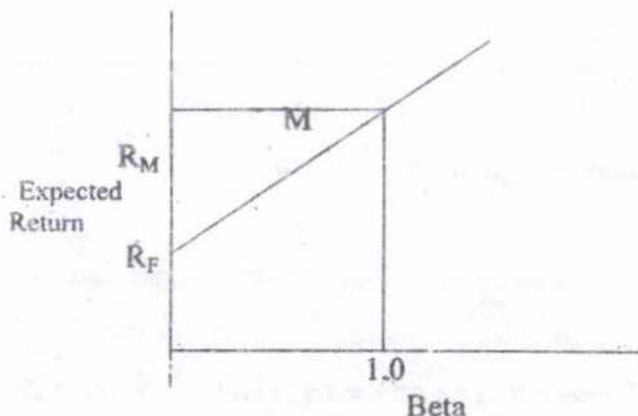
The term $(R_M - R_F) / \sigma M$ can be thought of as the extra return that can be gained by increasing the level of risk (standard deviation) on an efficient portfolio by one unit. The entire second term on the right side of the equation is thus the market price of risk times the amount of risk in the portfolio. The expression RF is the price of time; that is, it is the price paid for delaying consumption for one period. The expected return on an efficient portfolio is:

(Price of time) + (Price of risk) (Amount of risk)

Security Market Line

For well – diversified portfolios, nonsystematic risk tends to go to zero, and the only relevant risk is systematic risk measured by beta. Because we assume that investors are concerned only with expected return and risk, the only dimensions of a security that need be of concern are expected return an beta.

In case of portfolios involving complete diversification. the unsystematic risk tends to zero, there is only systematic risk measured by beta the only dimensions of a security. which concerns us are expected return and beta.



We have seen that all investments and all portfolios of investments lie along a straight line in the return-to-beta space. To determine this line we need only connect the intercept (beta of zero, or riskless security) and the market portfolio (beta of one and return of R_M). These two points identify the straight line shown in the figure. The equation of a straight line is:

$R_1 = \alpha + +b\beta$

The first point on the line is the riskless asset with a beta of zero, so:

$$R_F = \alpha + b(0)$$

$$R_F = \alpha$$

The second point on the line is the market portfolio with a beta of 1. Thus,

$$R_M = \alpha + b(1)$$

$$R_M - \alpha = b$$

$$(R_M - R_F) = b$$

Combining the two results gives us:

$$R_1 = R_F + \beta_1 + R_F)$$

This is a key relationship. It is called the security market line (SML). It describes the expected return for all assets and portfolios of assets, efficient or not. The difference between the expected return on any two assets can be related simply to their difference in beta. The higher beta is for any security, the higher must be its expected return. The relationship between beta and expected return is linear.

DEFENSIVE AND AGGRESSIVE PORTFOLIOS

Portfolios with beta in the range of –1 to +1 are considered as defensive portfolios. Portfolios with beta above +1 or less than –1 are aggressive portfolios. Aggressive Portfolio provide more return than the market when market is moving up and less return than the market when the same is going down.

SML Vs CAPM

Security Market Line (SML) is similar to CAPM, except that SML is about risk-return relationship of individual securities and inefficient portfolios, while CAPM deals with efficient portfolios.

The expected return of a security (or inefficient portfolio) relative to risk of the security (or inefficient portfolio) is depicted a Diagram 3.

$$E(r_1) = R + (E(r_m) - R)\, B_{im}$$

$$= R + \frac{(E(r_m) - R)}{\text{Variance of market return}}\; C_{ov}\ i, m, \text{ where,}$$

R – risk free return,

$E(r_m)$ – expected return on market portfolio.

C_{ov} i, m – Covariance between returns of i and on

The two components of $E(r_m)$ are risk-free return (or reward for waiting or time related gain) and risk premium. Risk premium is equal to price of risk and amount of risk. Price of risk is given by $(E(r_m) - R)$ / variance of market return and amount of risk is given by the Gov i, m.

Security 'O' is under priced with excess return. Due to a buy pressure its price will rise such that the equilibrium return $E(r_O)$ is reached. Security N is over priced and by the imminent selling pressure its price will get restored to the equilibrium level of $E(r_N)$ sooner than later.

Application of the Capital Asset Pricing Model

The CAPM has been used to select securities, construct portfolios, and evaluate portfolio or equity share performance. Securities for which normal returns are forecast are considered under-valued, that is, attractive candidates for purchase. Over-valued securities are those with below normal anticipated returns and are thus candidates for sale. The degree of over-valuation or under-valuation is determined by the security's alpha, or the distance that the risk-return plot for the security lies from the market line. Securities with positive alphas are attractive while negative alpha securities were considered (over-valued). Attractive (under valued) securities are those whose risk-return characteristics are plotted above the security market line. Fair priced securities lie directly on the line. The degree of under-valuation or over-valuation (the alpha) is simply the distance from the security's plot to the line represent the

analysts forecast of the security's relative attractiveness. In present, all forecasts should fall on the market line because beta and expected return are directly and linearly related (theoretically). In practice, forecasts do not fall on the market line, and practitioners believe that this process can be used effectively to select securities. In addition to selecting securities, beta has been used to control the risk level of a portfolio.

Corporate have used the CAPM in three related ways

i. to determine hurdle rates for corporate investment;
ii. to estimate the required returns for divisions, strategic business units, or lines of business; and
iii. to evaluate the performance of these divisions, units, or lines of business.

Using the CAPM to estimate the cost of equity for the firm is relatively common Because other equity cost methods require the use of a market determined equity price and estimates of future growth rates and dividends for the firm, the CAPM is of special interest to managers whose firms are closely held, pay no dividends, or have uncertain future rates of growth.

To develop this overall cost of capital, the manager must have an estimate of the cost of equity capital. To calculate a cost of equity, some managers estimate the firm's beta (often from historical data) and use the CAPM to determine the firm's required return on equity.

Managers often use the corporate cost of capital (usually a weighted average of the marginal costs of debt and equity) as the required rate of return for new corporate capital investments.

The CAPM can also be used by the regulations of public utilities. Utilities rates can be set so that all costs, including costs of debt and equity. Capital, are covered by rates charged to consumers. In determining the cost of equity for the public utility, the CAPM can be used to estimate directly the cost of equity for the utility in question.

Beta, independent of the CAPM, can also be used in utility regulation as a measure of risk. The beta for a given utility is used to choose a group of comparable (firms with similar betas). These proxy firms are usually in non-regulated business. The historical return or equity for this group of firms is then used as a forecast of the required equity return for the given utility.

Limitations of the capital assets pricing model

(1) The CAPM has been regarded as a useful tool for both analysts of financial securities and financial managers; it is not without its critics.

(2) A number of problems that exist in adopting the theoretical model for practical use. This factor also causes problem when empirical tests of the model are undertaken.

(3) To make that the model is ex-ante, ie. it is based on expectations about the future.

(4) The CAPM market portfolio includes all risky investments world-wide, while in practice this is replaced by a surrogate which relate to a particular national stock market.

EFFICIENT MARKET HYPOTHESIS

Security Analysis

The security market analysis refers to the analysis of markets and securities traded there in terms of the risk-return, quantities raised or traded, price trends and other indicators of the market. The market analysis is made in terms of fundamental macro factors in the economy and technical factors like price and volume trends in the market. As regards the risk-return factors, the expected return varies with the risk attached to the instruments. Some instruments like government securities, P.S.U. Bonds or UTI Units are least risky but have a cost in realisation. The cost of conversion or realisation of funds is zero in the case of bank deposits.

Valuation

The basic objective of market analysis is to know the fair valuation of shares for buying and selling. The valuation analysis in particular has two components, namely the market valuation at the macro level and the individual security valuation at the micro level. The macro level analysis is done at the micro level. The macro level analysis is done with the help of suitable price indices of the leading scrips in the market and their price-earning ratio. There are theoretically three approaches to market valuation, namely, efficient market hypothesis, fundamental analysis and technical analysis. Under fundamental analysis, the share value depends on the intrinsic worth of the shares, namely, its earnings potential. If the efficient market hypothesis is used, then the market becomes perfect and the entry into the market by buyers at any time gives equal benefit to all. The prices are determined in a random manner by competitive forces and perfect information flow and are independent of the past prices. This information is not only free and perfect, but it is absorbed fully and

immediately by the market. But in actual practice, the information flow is not free and perfect and markets are not, therefore, efficient. Where the efficient market hypothesis does not hold, technical analysis is applicable. Under technical analysis, the prices move in a predictable manner and in waves and trends. The present prices are the result of past trends and can accordingly by predicted. Thus by the use of analytical tools of charts and curves, the price trends can be studied and future trends can be predicted to decide on when to buy and sell.

EFFICIENT MARKET HYPOTHESIS

The efficient market hypothesis postulates that the market is efficient under free market conditions and it absorbs all the information through demanc and supply forces. Random walk theory can be considered as the special case of the more general efficient market hypothesis. Market efficiency refers to the ability of the market to reflect all published information about the securities in their market price. Market efficiency implies that all publicly available information are immediately discounted by all investors and reflected in share prices in the share market.

Any new information that is price sensitive will produce random price charges, i.e. not subject to any pattern, since new information flows are very likely to be random. Efficient market is expected to behave in a systematic manner. Certain requirements have to be fulfilled in order to discount all price sensitive information instantaneously in the price. They are enumerated below:

(a) capital market must encourage worth worthless by withdrawal of capital;

(b) information must be freely available:

(c) capital is available to all borrowers at the same rate of interest:

(d) there must be no transaction costs;

(e) investors are rationale;

(f) the market shifts to a new equilibrium whenever new information flows in and hence a fresh price change takes place;

(g) tax has no impact on investment policy;

(h) information is speedily spread across the length and breadth.

In an efficient market no investor can have an edge over the other to make a gain or avoid a loss by having an information leverage, for information is evenly and spatially spread. This is a perfect market of one price for all.

Are Markets Efficient?

When a query is raised as to the efficiency of markets, the reply would be possibly the market would not be fully efficient. There are varied levels of efficiency. On the basis of this variation, we have weak form, semi-strong form and strong form of markets. An attempt has been made to describe these forms as detailed below:

I. Weak Form

The weak form says that the current prices of stocks already fully reflect all the information that is contained in the historical sequence of prices. Therefore, there is no benefit – as far as forecasting the future is concerned – in examining the historical sequence of prices. This weak form of the efficient market hypothesis is popularly known as the random-walk theroy. Clearly, if this weak form of the efficient market hypothesis is true, it is a direct repudiation of technical analysis. If there is no value in studying past price changes, there is no value in technical analysis. Technicians place considerable

reliance on the charts of historical prices that they maintain even though the efficient-narket hypothesis refutes this practice.

Weakly Efficient Form Of Market

The weakly efficient form hypothesis states that no investor can benefit by using price and volume information of the past to outperform rest of investors continuously. That is past prices do not contain any clue to future price trend. The conclusion of the weak form hypothesis is acceptance of the random walk theory and rejection of technical analysis. In effect short term trader cannot earn a return above what could be earned by buy hold investors. Several test were conducted to prove the weak form. Simulation Test was adopted by Roberts and Osborne. Roberts showed that the random walk mechanism was similar to stock price movements and further showed that a series of random numbers closely resembled are actual stock price series. Osborne's research showed that, stock prices moved similar to Brownian motion, (ie. randomly) which is a description of movements of particles in the solution where movements of different amplitude occur at any time irrespective of amplitude of previous movements.

Serial Correlation Test was adopted first by Moore and later by Fama to test the weak form. Serial correlation is correlation is correlation between a series of numbers which are separated by some constant time period. Price data of a scrip on 1st,8th, 15th,22nd,29th,36th,43rd, 50th, ... Days of a year and price of the same scrip on 8th,15th,22nd,29th,36th,43rd,50th,57th, ... days of the year may form the two series of data for which correlation is worked. The type of correlation is knows as serial correlation with a time gap of a week. If the correlation to zero, it can be held that past data had no association with later

data. Moore and Fama obtained in their test very low negative correlation co-efficient (close to zero) and proved that weak form of efficiency prevailed in the stock market.

Run Test is another test adopted by Fama to test the weak form. Daily price charges are counted in the form of "runs" (consecutive changes in the same direction). The actual number of runs is observed and correlated with the expected numbers of run, randomness is confirmed and vice-versa.

Filter Test was developed by Alexander in 1961. If a stock declined from a previous high point and the decline is in excess of a specified percentage, the stock should be sold. The percentages can be any. Alexander found that small filters of 4.5% produced large rates of return, but when the transaction cost was considered, abnormal returns disappeared. That is past price movements information cannot be used to make abnormal going in the future. Later Fama and Blume applied the test to get the same conclusion. There are certain anomalies in the weakly efficient form. Certain scrips have week-end effect, i.e peaking during Fridays and year and effects i.e troughing by December by few percent points. To the extent the end-effects are true a gain from past information is possible.

II. Semi-strong Form

The semi-strong form of the efficient-market hypothesis says that current prices of stocks not only reflect all informational content of historical prices but also reflect all publicly available knowledge about the corporations being studied. Further more, the semi-strong form says that efforts by analysts and investors to acquire and analyse public information will not yield consistently

superior returns to the analyst. The semi-strong form of the efficient market hypothesis maintains that as soon as information becomes publicly available, it is absorbed and reflected in stock prices. Even if this adjustment is not the correct one immediately, it will in a very short time be properly analysed by the market. Thus the analyst would have great difficulty trying to profit using fundamental analysis. Further more, even while the correct adjustment is taking place, the analyst cannot obtain consistent superior returns. Because the incorrect adjustments will not take place consistently. Tests of semi-strong form of the efficient-market hypothesis have tended to provide support for the hypothesis.

The semi-strongly efficient hypothesis says that markets are efficient enough for prices to reflect all publicly, available information. Accordingly insiders, who have access to price sensitive information, can avoid loss or book gain at the cost of the general investors. When a new price of information arrives in the market, the market immediately discounts the same and new equilibrium price results.

Semi-strongly efficient markets can be tested through learning lags, if any. Learning legs refer to delay in learning a particular item of price sensitive news of a scrip due to delayed spread of information in certain parts of the land due to communication bottlenecks. It is natural that price sensitive news get disseminated faster in the metros, slower in the cities and still slower in towns and villages. So, price change of a script first reflects the response of the investors in the metros, next reflects that of the city based investors and then that of the up-country investors. Thus a trend in price results. Say a favourable information is out, for 3 to 4 days a rising price trend can be expected. And

until the fourth day, market does not entirely reflect the available information. But, researches on learning lags have established on learning lags effect for information now spreads evenly wider and faster.

Credit polity announcement, dividend bonus and rights announcements, stock split announcements, etc. influence price of scrips. But the price changes happen more or less immediately and sometimes even before formal announcements takes place. Researchers show in about 5 days price level finds a new equilibrium. Due to over or under reaction, a pro-change or reverse-change price movements might happen, which cannot be considered as price trend. In all no abnormal return can be made by a trader, as against a native buy and hold investor. Further research studies a to low-price earnings multiplier scrips and on small size company scrips (which are seemingly attractive for short term traders as against a buy-hold investors) also indicate semi-strong form does to ensure short period gains and that the market discounts all the publicly available information sooner than later.

III. Strongly Efficient Market

Strongly efficient market reflects all information in security price. These markets are in continuous equilibrium and are perfect market. Rarely we come across strongly efficient market for information leverage is widely by insiders despite insider trading laws being stringent. Strongly efficient market hypothesis is generally rejected.

The strong form of the efficient-market hypothesis maintains that not only is publicly available information useless to the investor or analyst but all

information is useless. Specifically, no information that is available, be it public or "inside", can be used to earn consistently superior investment returns.

The semi-strong form of the efficient-market hypothesis could only be tested indirectly– namely, by testing what happened to prices on days surrounding announcements of various types, such as earnings announcements, dividend announcements, and stock-split announcements. To test the strong form of efficient-market hypothesis, even more indirect methods must be used. For the strong form, as has already been mentioned, says that no type of information is useful. This implies that not even security analysts and portfolio managers who have access to information more quickly than the general investing public are able to use this information to earn superior returns. Therefore, many of the tests of the strong form of the efficient market hypothesis deal with tests of mutual-fund performance.

TREND WALK THEORY

This is a negation random walk theory. Prices move such a trend can be seen. As such, trend walk theory is a supporter of technical analysis. The correlation coefficient used to be negative with downward sloping trend walk and perfectly negative with see-saw pattern of predictable reverse. Technical analysis hold the view such prices depict a trend.

Factors Influencing Efficient Market Theory

The advocates of the efficient market theory are matched by an equally eloquent opposing camp which argues that the stock market is neither competitive nor efficient. The following are the factors influencing efficient market theory.

1. Information Inadequacy

Information is neither freely available nor rapidly transmitted to all the participants in the stock market. In addition, there is a calculated attempt by many companies to circulate 'misinformation'.

2. Limited Information Processing Capabilities

Human information processing capabilities are sharply limited. An Nobel Laureate Herbert Simon observed: "Every human organism lives in an environment which generates millions of new bits of information every second, but the bottleneck of the perceptual apparatus certainly does not admit more than a thousand bits per second and possibly much less".

Taking a dig at the experts who claim to have superior information processing abilities, David Dreman said, "Under conditions of anxiety and uncertainty, with a vast interacting information grid the market can become a giant Rorschach test, allowing the investor to see any pattern he wishes . . experts can there – a phenomenon called illusory correlation.

3. Monopolistic Influence

In theory, the market is regarded as highly competitive. No single buyer or seller is supposed to have undue influence over prices. In practice, powerful institutions and big operators weild great influence over the market. The monopolistic power enjoyed by them diminishes the competitiveness of the market.

Role Of Intrinsic Value

According to Random Walk Theory, security's intrinsic values change and market prices move randomly around these intrinsic values. The new information affecting the market arrives at random intervals. This new information will force the analysis to re-estimate the intrinsic value and again the stock prices move randomly around the new intrinsic value.

This Theory thus states the security prices move randomly in the continuous fashion to set new equilibrium's. There may be upward or downward movements and changes take place in a random manner. If the trade barriers are imposed, then there may be lower reflecting barriers (support lines) or upper reflecting barriers (resistance lines) etc. The movements in share prices thus move generally within a narrow band, in a random fashion and these trends are changed from time to time with the flow of new information. With perfect absorption, there will be continuous moves to equilibrium and this is what Samuelson had in continuous equilibrium model, under perfectly efficient market conditions leading to perfectly information, which will change the stock prices, following the changes in the estimates of intrinsic value of the company's shares.

RANDOM WALK THEORY

The market price fluctuates around intrinsic value. That is, price movements happen around value. But the movements will have no pattern. These are simply random fluctuations but around the intrinsic value. A drunken person is left in a play ground. After sometime he was found lattering about the same place where he was left. That is he randomly walks about the place he was left originally without making any definite march in any direction.

Likewise, market price influctuates randomly around the real or economic or intrinsic prices.

Random Walk Assumptions

The Price movements under Random Walk Theory are randomly distributed, in such a way that the present steps are independent of past steps and in view of such random movements entry into the market any time gives same returns for the same risk to the investors.

This theory is based on the following assumptions

(1) Market is perfect and free without any restrictions.

(2) Market absorbs all the information quickly and efficiently .

(3) Information is free and costless and is quickly available to all at the same time.

(4) Information is unbiased and correct

(5) Market players can analyse the information quickly and the information is absorbed in the market through buy and sell rights.

(6) Demand and supply pressures are absorbed in the market through price changes. Such absorption leads to quick and prompt movements in prices which are random is fashion.

The theory states that no sure prediction can be made for further movement or trend of share prices on given prices at the end of one period as stock prices move randomly and does not have any bearing on the past. Market prices cannot be predicted because they are mere statistical ups and downs. There is no relationship between present prices and future prices and prices are independent.

Random theory states that share prices will rise and fall on the whims and fancies of and the manipulations of, individuals and there is no need to study the trends and movements of shares prior to making investments decisions. The theory assumes that people follow the crowd.

In USA, the Random theory is called the 'great fool theory'. The Random Walk theory has gained weight form the fact that two basic methods of predicting prices – fundamental and technical analysis – are not infallible. The future is unpredictable and uncertain.

Advantages of Random Theory

(1) The question of good or bad judgement does not arise as shares are picked up without preference or evaluation. It is easier for persons to invest with confidence, who have no knowledge of stock market.
(2) There is no risk being ill informed while making a choice as no information is sought or concealed. The shares are picked up without bias.
(3) The Random theory is speculation at best and gambling at the work. It assumes that prices will and must rise, come what may thus; every investment is prove to risk.

While following Random Walk theory investor should try to diversify his portfolio as much as possible. This will eliminate possible risk inherent in an individual company. Investor should also create a long-term holding as Random theory is effective and rewarding in the long run.

Random Walk theory assumes that there is no discrenible pattern to travel the length. size and direction of next phase or step cannot be predicted on the basis of the previous one. Random Walk is a term which is generally used in statistics and mathematics to explain a process in which subsequent or following changes are statistically independent of each other.

Random Walk theory is a negation of any pattern in the movements of market price. In other words, past price is no mirror of the future. History does not repeat. Price movements in a perfect market will be statistically independent of one another. Random Walk theorists hold that stock prices are moving randomly about a trend line which is based on expected earning power. Analysis of past price data will give no clue to track future price movements, just like knowledge of steps movements of a drunker person is no help to know his likely step movements further. This is random walk theory. But later is was found by experts that stock price movements are not perfectly random. Hence random walk theory was renamed as efficient market hypothesis by Eugene Fama in 1970.

Implications of Random Walk for Technical and Fundamental Analysis

What the random-walk theory (particularly the semi-strong form) really says to the fundamentalist operating in a random-walk world is that his fundamental analysis must be truly exceptional so that he can size upon opportunities when security prices differ somewhat significantly from their intrinsic value. This means that the fundamentalist can be successful only in those instances when he either possesses superior insight into the company's future prospects or possesses inside information. It is clear even under random walk that such superior fundamental analysis will lead to superior profits for the

astute security analyst or investor who projects his own data and does not merely rely and already publicly available historical data.

The random-walk is inconsistent with technical analysis, or chartism. Whereas random walk states that successive price changes are independent, the chartists claim that they are dependent – that is, that the historical price behaviour of the stock will repeat itself into the future and that by studying this past behaviour the chartist in fact predict the future. Random walk directly opposes this line of reasoning and relegates technical analysis to a curious position of mysticism, seemingly completely unfounded on any substantive facts.

QUESTIONS

1. Mention the assumptions of Capital Asset Pricing Model.
2. Investment decision basically involves risk-return trade off-Explain.
3. Discuss the use of CAPM in security analysis.
4. What is meant by security analysis? State the subjects covered under security analysis.
5. Explain the applications of CAPM.
6. What are the limitations of CAPM?
7. In the context of CAPM with unlimited borrowing and lending at the risk free rate of interest, explain the meaning of the capital market line.
8. At what common point do the characteristic lines of individual securities intersect under the CAPM?
9. Compare and contrast the capital market line with security market line.

10. Write short notes on:

(a) Capital Market Line (b) Security Market Line

(c) Applications of CAPM.

11. What is meant by efficient market hypothesis?

12. Explain the efficient market hypothesis in each of its three forms.

13. Examine the sequence of events might bring about an efficient market.

14. Does the Random Walk Theory suggest that security price levels are random? Explain.

15. Discuss the semi-strong efficient market hypothesis.

16. What is the implication of an efficient security market for the return an investor will earn over a period of time?

17. Differentiate between systematic and unsystematic risk.

18. Write a note on Trend Walk Theory.

19. What is an efficient market? Describe the three forms of efficient market.

20. Write short notes on –

(a) Intrinsic value
(b) Semi-strongly efficient market
(c) Random Walk Theory.

LESSON – 7

PORTFOLIO PERFORMANCE

The set of all securities held by an investor is called his portfolio. The portfolio may contain just one security. However, since in general no one puts all one's eggs in one basket, it will contain several securities. Such a portfolio is knows as a diversified portfolio.

The portfolio theory makes two fundamental assumptions about the behaviour of the investors with respect to risk and return from securities. These are; (a) if two portfolios have identical expected returns, then investors would choose that portfolio which has a lower risk, and (b) if two portfolios have identical risk, then investors would choose that portfolio which has a higher expected return. On the face of it, these do not appear to be very unreasonable assumptions to make.

This tendency in an investor to maximise his benefits for a given risk level, or minimise the risk for a given benefit level is also known as risk aversion. The credit examining this relationship between risk and expected (or mean) return in detail goes to Harry Markowitz. One of the three Nobel Prize winners in economics for 1990, whose work on men-variance framework in the fifties set the stage for a more rigorous and objective handling of the risk parameter in the literature on capital markets.

PORTFOLIO MANAGEMENT

Portfolio management is a process encompassing many activities of investment in assets and securities. It is a dynamic and flexible concept and involves continuous and systematic analysis, judgement and operations. The

bjective of this service is to help the novices and uninitiated investors with the expertise of professionals in portfolio management. Firstly it involves construction of a portfolio based upon the fact sheet of the investor giving out his objectives, constraints, preferences for risk and return and his tax liability. Secondly, the portfolio is reviewed and adjusted from the time to time in tune with the market conditions. The adjustment is done through changes in the weighting pattern of the securities and asset classes in the portfolio. The shifting of assets and securities will take advantage of changes in market conditions and in prices in the securities and assets in the portfolio.

COMBINING SECURITIES

Although holding two securities is probably less risky than holding either security alone, is it possible to reduce the risk of a portfolio by incorporating into a security whose risk is greater than that of any of the investments held initially? Fox example, given two stocks, X and Y, with Y considerably more risky than X, a portfolio composed of some of X and some of Y may be less risky than a portfolio composed exclusively of the less risky asset X.

The risk involved in individual securities can be measured by standard deviation or variance. When two securities are combined, we need to consider their interactive risk, or covariance. If the rates of return of two securities move together, we say their interactive risk or covariance is positive. If the rates of return are independent, covariance is zero. Inverse movement results in covariance that is negative. Mathematically covariance is defied as

$$cov_{xy} = \underline{1}\; n[R_X - R_Y]\,[R_Y - R_Y]$$

Where the probabilities are equal and

Cov_{xy} = covariance between x and y

R_x = return on security x

R_y = return on security y

$\bar{R}_x$ = Expected return to security x

$\bar{R}_y$ = Expected return to security y

N = Number of observations

PORTFOLIO CONSTRUCTION

It refers to the allocation of funds among a variety of financial asets open for investment. The objective of the theory is to elaborate the principles in which the risk can be minimised, subject to a desired level of return on the portfolio or maximise the return. To realise this objective, the portfolio manager has to keep a list of such investment avenue along with the return-risk profile tax implications, yields and other avenues, such as convertible options, rights etc.

The portfolio construction is made on the basis of the investment strategy, set out for each investor. Through choice of asset classes, instruments of investments and the specific scrips say of bonds or equities of different risks and return characteristics, the choice of tax characteristics, risk level and other features of investments are decided upon.

Efficient Portfolio

To construct an efficient portfolio, we have to conceptualise various combinations of investments in a basket and designate them as portfolios 1 to n.

then the expected returns from these portfolios are to be worked out. The risk on these portfolios is to be estimated by measuring the stasndard deviation of different portfolios returns. To reduce the risk, investors have to diversify into a number of securities whose risk-return profiles vary.

EVALUATION OF PORTFOLIO PERFORMANCE

Evaluation of portfolio performance facilitates the investors to appraise how well the portfolio manager has done in achieving desired return targets and how well risk has been controlled in the process. It enables the investors to assess how well the manager has achieved these targets in comparison with other managers or alternatively, with home passive investment strategy. Finally it provides for a mechanism for identifying weaknesses in the investment process and for improving these deficient areas. Nevertheless, historical performance evaluation can serve as the starting point for estimating future prospects and can serve as a feed back mechanism for improving the ongoing portfolio management process.

The portfolio manager is required to make proper diversification into different industries, asset classes and instruments so as to reduce the unsystematic risk to the minimum for a given level of return. The market related risk has to be managed by a proper selection of Beta for the securities. There was on composite index which measured both return and risk under the Theory. In Modern portfolio theory it became necessary to develop some composite measures of both return and risk in portfolio performance, as the objective now is maximisation of return and minimisation of risk. On account of the trade off between them, simple maximisation of returns or single goal of minimisation of risk will be defeating the objectives of Modern portfolio

management. It was in this context that later researchers have tried to evolve a composite index to measure risk based returns taking into account the different components of risk. viz. systematic. unsystematic and residual risk. The credit for evolving these criteria goes to Sharpe. Treynor and Jensen.

Example of Sharpe's Measure

Sharpe's measure is $ST = \frac{Rt - Rf}{\sigma f}$

Where ST is shape index when. Rt is average return on portfolio. Rf is risk free return.

It measures total risk by standard deviation. Reward is in the numerator as Risk premium. Total risk is in the denominator as standard deviation of its return. We get a measure of portfolio's total risk and variability of returns in relation to the risk premium which is the product of the portfolio manger's expertise. The measure ST. Of one portfolio has more ST than other. the first one is better performer as per the sharpe's neasure. Take the following example·

Portfolio	*average returr*	*s.d*	*average rf (risk of free rate)*
a	20%	4%	10%
b	24%	8%	10%s

By applying the above formula. we have

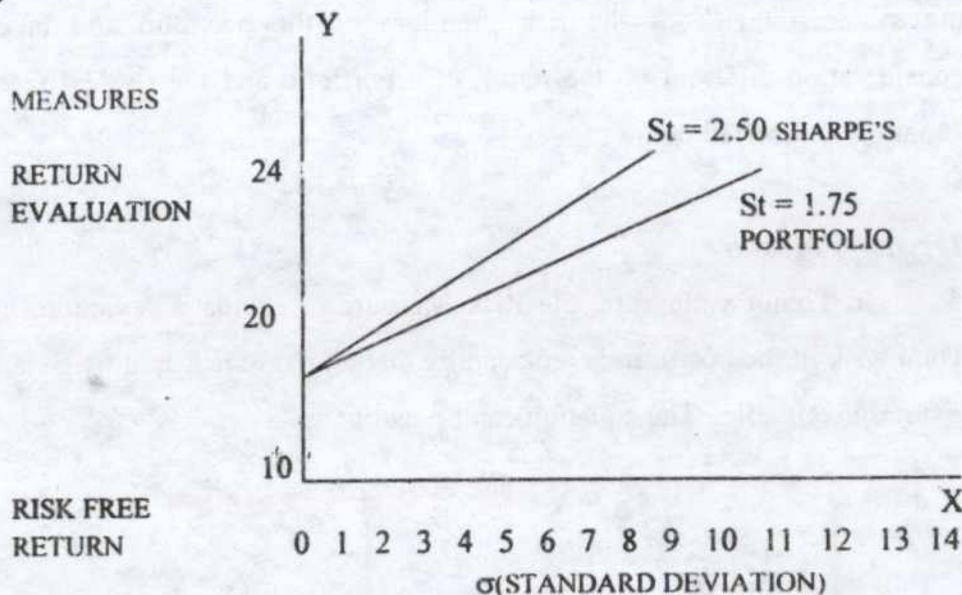
For A portfolio

$$St_A = \frac{0.20 - .10}{.04} = \frac{.10}{.04} = 2.50$$

$$St_B = \frac{0.24 - .10}{.08} = \frac{.14}{.08} = 1.75$$

As the first one is ranked higher at 2.5% more than the second 1.75, the first is a better performer. This is shown graphically as follows:

Figure



Treynor's Model

Performance Measure For Portfolios

In Treynor's model, the inter-section at 45° angle represents that return which is equivalent to the return on the market portfolio. The ideal fund is depicted to the left of 45° line. This is also above the imaginary 45° line. The return on this line is higher than that which is earned on the market portfolio. Under Treynor's model if the market portfolio that reveals a negative return, the return under this model if the market portfolio that reveals a negative return, the return under this method is positive but if the market return is positive the return under the model of characteristic line is still higher. The characteristic

line draws a relationship between the market return and a specific portfolio without taking into consideration any direct adjustment for disk. When the investors make a comparison of the characteristic lines by taking into consideration their slopes then the steeper the line the higher the volatility or the movement in the fund. The Treynor's performance measurement measures the systematic risk or the risk premium of the portfolio and takes into consideration different on the return of a portfolio and the riskless rate. The equation is depicted below:

Treynor's Measure

In Trenor's measure, the Risk Measure of standard deviation, namely, Total Risk of the portfolio is replaced by market risk, measured by Beta, which is not diversifiable. The equation can be set out as:

$$T_n = \frac{Rn - Rf}{\beta_n}$$

T_n = Treynor's Measure of evaluation

R_n = Return on the portfolio. Rf = Risk free rate, B_n is Beta of the portfolio as a measure of Systematic risk.

Treynor based his formula on the concept of characteristic line. This line is the least squares Regression line relating the return to the risk and Beta is the slope of the line. The regression line takes the form of

$R_p = \alpha + bx + e$

R_p is the Return of portfolio

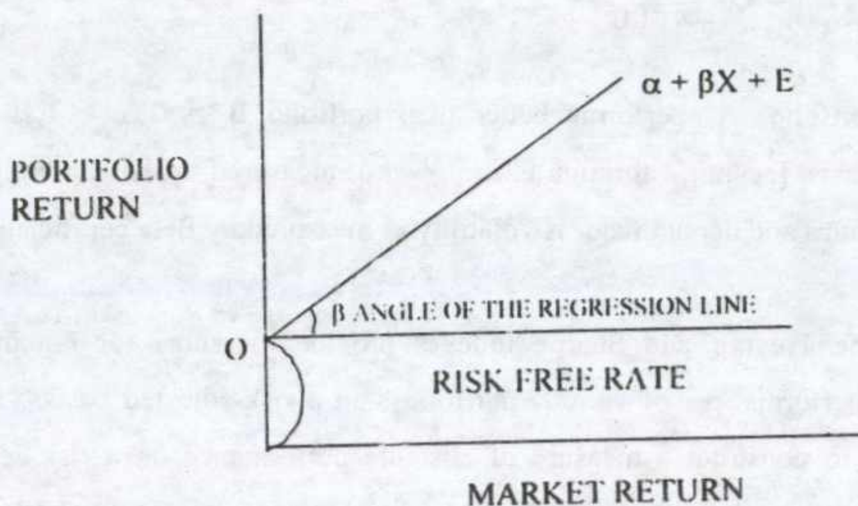
α is the intercept reflecting the Risk free return

β is the slope of the line and is the market Return and e is the error term.

This concept can be graphically represented as follows:

Based on this characteristic line Treynor formula is

$$T_n = \frac{Rn - Rf}{\beta_n}$$



Beta is the slope of the line indicating the relationship between scrip return and Market Return.

Illustration

Portfolio	Return	B_n	R_f
A	20	0.5	10
B	24	1.0	10

$$\text{For A, } T_{nA} = \frac{.20 - 10}{0.5} = \frac{.10}{.5} = 0.2$$

$$\text{For B, } T_{nB} = \frac{24 - 10}{1.0} = 0.14$$

Portfolio 'A' performs better than portfolio B as $T_{nA} > T_{nB}$. The numerator is Treynor's formula is the reward, measured by Risk premium or excess return and denominator is volatility as measured by Beta coefficient.

The Treynor and Sharpe Indexes provide measures for ranking the relative performances of various portfolios, on a risk-adjusted basis. Jensen attempts to construct a measure of absolute performance on a risk-adjusted basis – that is, a definite standard against which performances of various funds can be measured. This standard is based on measuring the "portfolio manager's predictive ability – that is, his ability to earn returns through successful prediction of security prices which are higher than those which we would except given the level of riskness of his portfolio".

Jensen's Model

Jensen's model is similar to the Sharpe's index model and the Treynor's index model. but it shows that the performance of a portfolio can be on any point including the origin.

$R_{jt} = R_{ft} = \alpha_J + \beta_J (R_{Mt} - R_{ft})$

R_{jt} = Average return on portfolio J for period 't'

R_{ft} = Risk free rate of return for period 't'

458 α_J = Risk free rate of return for period 't'

β_i = Systematic risk measure

R_{Mt} = Average return on the Market Portfolio for period 't'

It is possible that $\alpha_J = 0$, which is neutral performance or the same as that of market.

$\alpha_1 > 0$, it is superior performance over the market

$\alpha_1 < 0$, it is inferior performance

Jensen's Measure

Jensen's measure of the performance of portfolio is different from that of Sharpe and Treynor in that the latter provide a measure of ranking the relative measure of absolute performance on a risk adjusted basis. This standard, based on CAPM. measures the portfolio Manager's predictive ability to achieve higher return than expected for the given riskiness.

The Jensen s approach can be illustrated by an example.

The data on portfolio results: Beta of the portfolios and Market Index results are set out as follows:

Portfolio	Return as Portfolio	Portfolio Beta
1	18%	1.2
2	15%	0.8
3	21%	1.5
Market Index	16%	16%

Market Beta 1.0 and Risk free Rate 10%

The return of 3 portfolios on the basis of CAPM are as follows:

$R_P = RF + (M_j - M_F)\,\beta$

(1) Portfolio I = 10 + (16 – 10) x 1.2 = 17.2%

(2) Portfolio II = 10 + (16 – 10) x 0.8 = 14.8%

(3) Portfolio III = 10 + (16 – 10) x 1.5 = 0.8%

Actual realised Portfolio I = 18 – 17.2 = 0.8%

Portfolio II = 15 – 14.8 = 0.2%

Portfolio III = 21 – 19.0 = 2.0%

PORTFOLIO REVISION

Portfolios are owned by individuals and organisations having dramatically different objectives and constraints. Portfolio objectives usually are related to achieving the greatest return for a given risk level. The portfolio once constructed undergoes changes due to changes in market prices and a reassessment of companies. Portfolio revision will take place and composition of portfolio will change. Constant market changes necessitate readjustment of

portfolio leading to purchases and sales of equities, bonds etc. which in turn will result in change in Beta and duration.

FORMULA PLANS

The investor uses formula plans to facilitate him in making decisions for the future by exploiting the fluctuations in prices. The three-formula plans which are useful in making decisions are (a) the constant rupee value (b) the constant ratio (c) the variable ration formula plans. The formula plans have sketched the basic rules and regulations for purchasing and selling of investments. The formula plans make the average investors superior to others. These formula plans are based on the fact that the investors will not have the problem of forecasting fluctuation in stock prices and will continue to act according to formula.

The plans have a method of building two portfolios – the conservative portfolio and the aggressive portfolio. These plans are not flexible and are predetermined course of action specified for the investors.

Rules for Formula Plans

1. These plans work according to a methodology which is related for the working of each plan.
2. These plans cannot be used for short periods of time. The longer the period of holding the investments, the easier for formula plans to work.
3. Generally, the formula plans are strict, rigid and straight forward but they are not flexible.

These plans suggest that there must be two portfolios of an investor, namely aggressive portfolio of an investor. namely aggressive portfolio and conservative portfolio. These plans do not have a selection procedure for the stocks. The methodology adopted by the formula plans is to find out the difference in movements of the aggressive portfolios and the conservative portfolios. The formula plans disclose that when the stocks must be purchased and sold.

An aggressive portfolios will determine the volatile nature of the portfolio and will have large number of fluctuations; whereas the conservative portfolio will be planned to complement the aggressive portfolio and will consist of bonds. The conservative portfolio is a mechanism of defensive operations. The two portfolios when combined together will achieve the results as planned by the formulae.

Following are three – formula plans that are found useful in making decisions-

(1) The Constant Rupee Value

(2) The Constant Ratio

(3) The Variable Ratio Formula Plans

1. Constant Rupee Value Plan

This plan indicates the rupee value which remain constant in the stock portfolio of the total portfolio. This formula indicates the investor that whenever the stock value rises his shares should be sold to maintain a constant portfolio. If the price of the stock falls, the investor must buy additional stock to keep the value of aggressive portfolio constant. By specifying that the

aggressive portfolio will remain constant in money value, the plan also specified that remainder of the total fund be invested in the conservative fund.

This formula plan also indicates to the investor how to place the action points, i.e. the period of time when action should be taken. The action points can be said to be a trade-off between stock and profitability. The investor under the constant rupee value will require the knowledge of how 'low' the fluctuations may go but it does not require the forecasting of an upward movement or limit of price rise. So the forecasting by the investor is required even under the constant rupee value formula but the knowledge will be regarding the lower limits or the depression values of the fluctuations.

2. Constant Ratio Plan

Under the constant ration plan, however, both the aggressive and defensive portions remain in constant percentage of the portfolio's total value. This plan method of identifying the ratio of the value in the aggressive portfolio to the value of the conservative portfolio. The aggressive portfolio divided by the market value of the total portfolio should be held constant. The constant ratio plan holder can adjust portfolio balance either at fixed intervals or when the portfolio moves away from the desired ratio by a fixed percentage.

The formula plan based on constant ratio does not require the investor to make forecasts of the lower levels at which the prices fluctuate. Under this plan, the aggressive value is always to be kept by the investor constant of the portfolio's take a long time to move in a direction which is either upwards/downwards, thus this plan does not work at its optimum value. Under this plan, the investor will get high profits if there is a continuous sustained rise

or fall in prices. These profits would be higher rather than under the constant rupee value plan or variable ratio plan. The main advantage of the constant ratio plan is the automatism with which it forces the manager to adjust counter cyclically his portfolio.

3. Variable Ratio Plan

Under this plan, the ratios are varied whenever there is a change in the economic or market index. The significant tool of the variable ratio plan is said to be forecasting. The investor is required to make forecasts in the range of fluctuations which more both above and below the median to find out the different ratios at different levels of stock. The investor lowers the aggressive portion of the total portfolio as stock prices rise and steadily increases the aggressive portion as stock prices fall. Whenever there is a growth trend for common stock, then the variations can be accounted for by exploiting the fluctuations around the long term trends.

It is clear form the above discussion, that formula plans are useful for making a decision on the timing of investments. They function according to a methodology which is related for the working of each plan. The utility of the formula plans call for the application of plans in a systematic and methodical manner. These plans enable the investors to assess the total amount that he must spend on purchases. The formula plans make the average investor who adopts these techniques superior to other investors. These plans are based on the feet that the investor will not have the problem of forecasting fluctuation in stock prices and will continue to act in the light of the formula given to him. Besides using the formula plans, the investor must consider every stock that he puts in his portfolio with respect to growth potential of the securities.

CHART 5.1

OPPORTUNITY SET AND EFFICIENT FRONTIER OF PORTFOLIOS

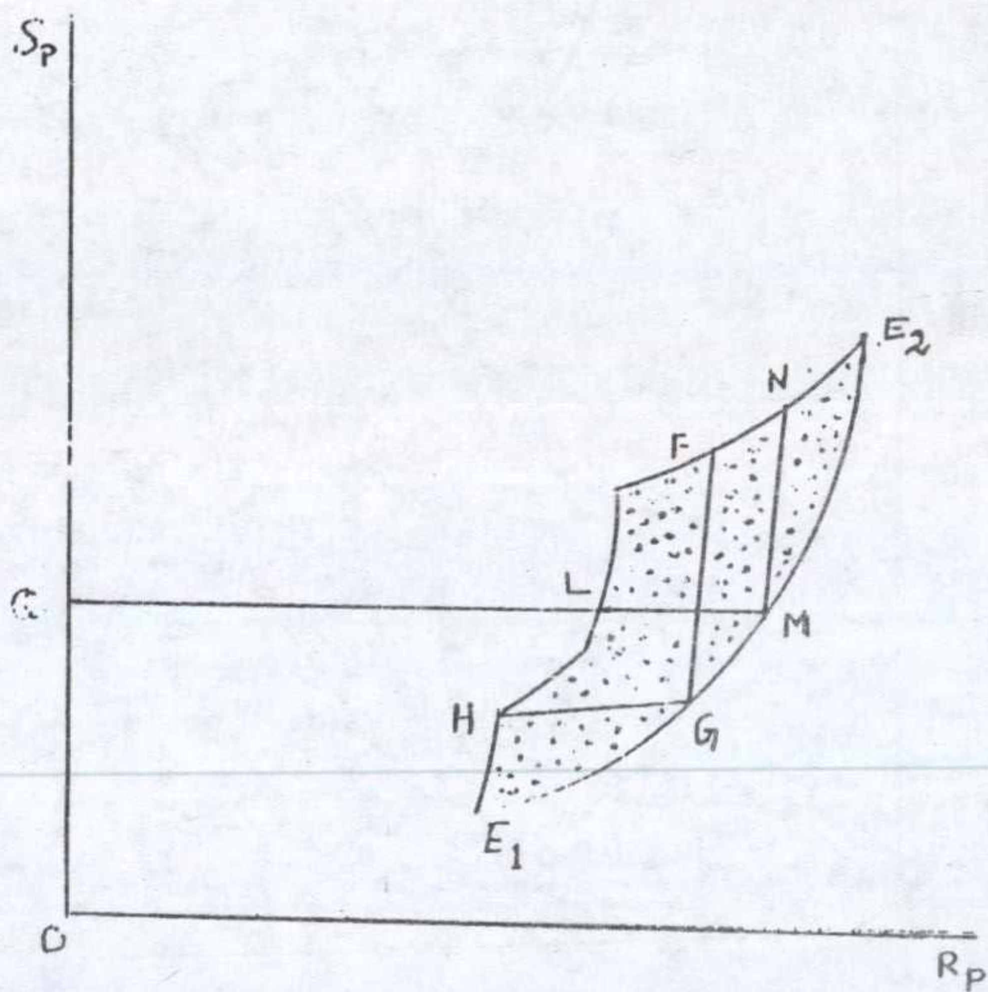
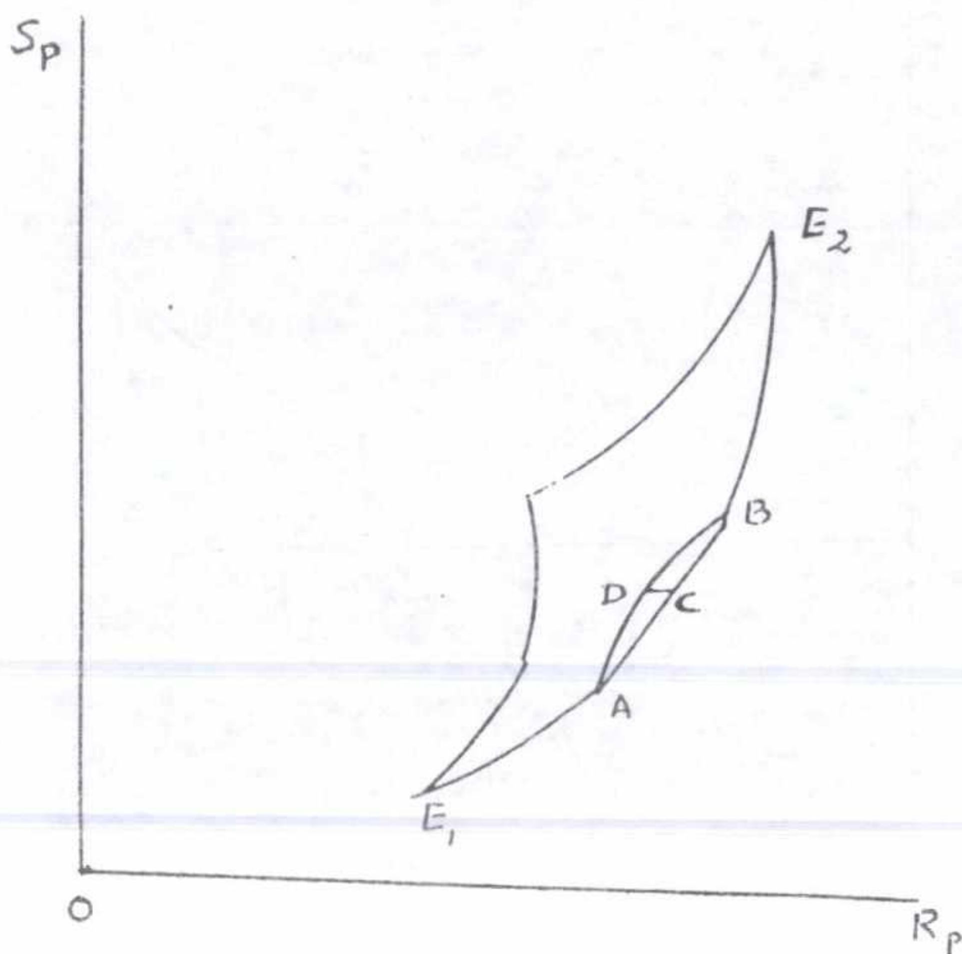


CHART 5.2

IMPOSSIBILITY OF DENT IN THE EFFICIENT FRONTIER



RISK – RETURN INDIFFERENCE CURVES

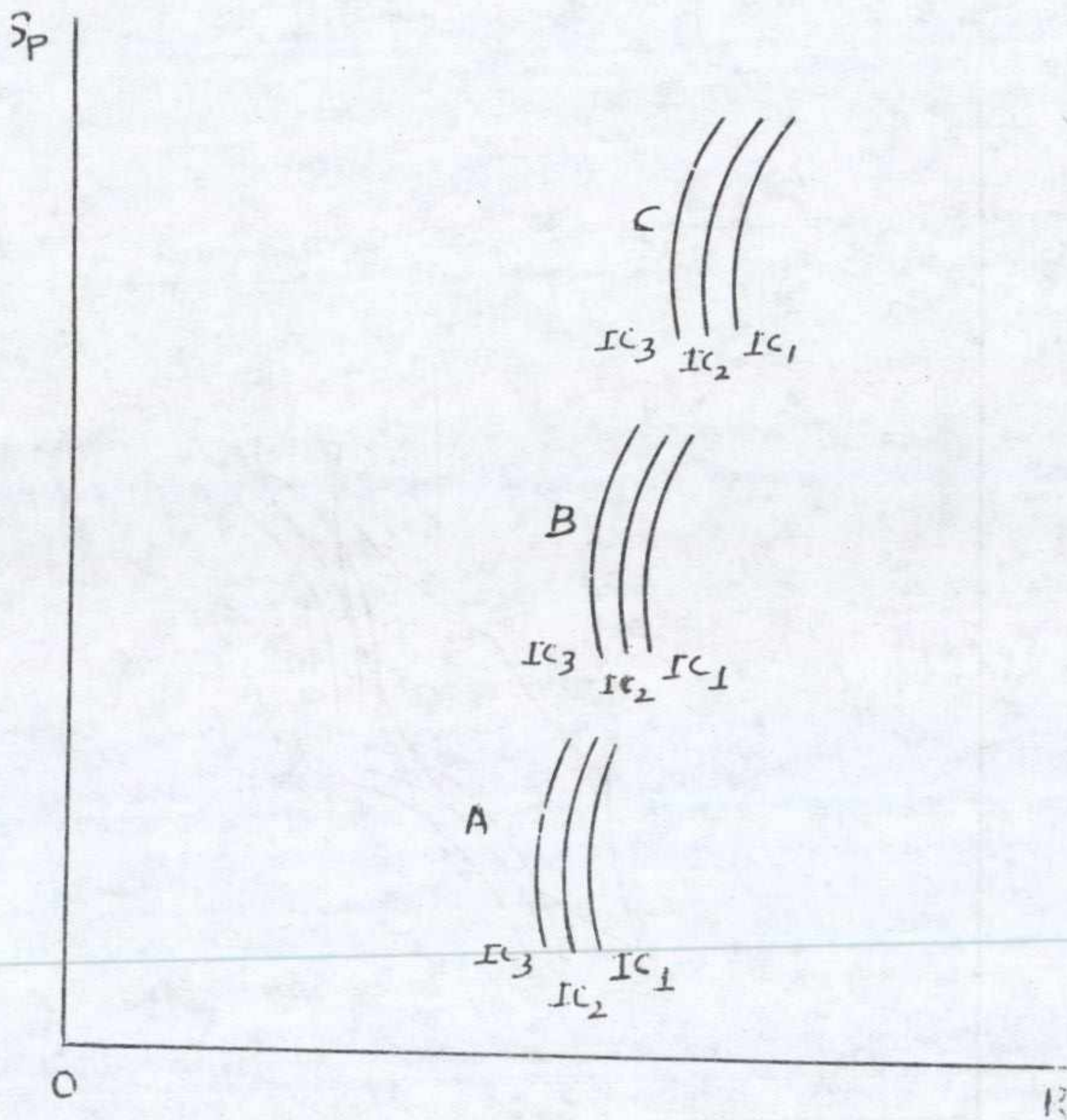


CHART 5.4

CHOICE OF PORTFOLIO
(All risky securities)

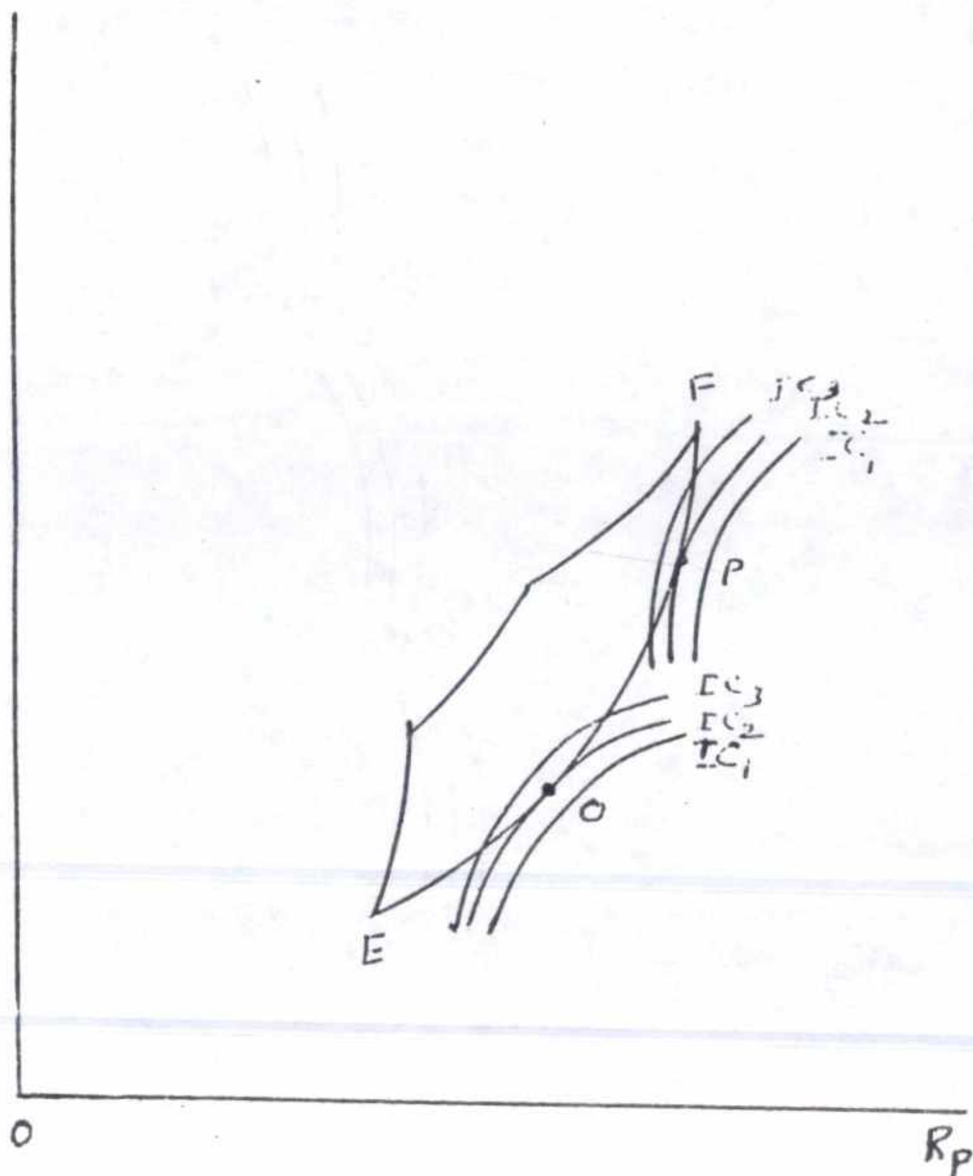


CHART 5.5

CHOICE OF PORTFOLIO
(Risky and Risk free securities)

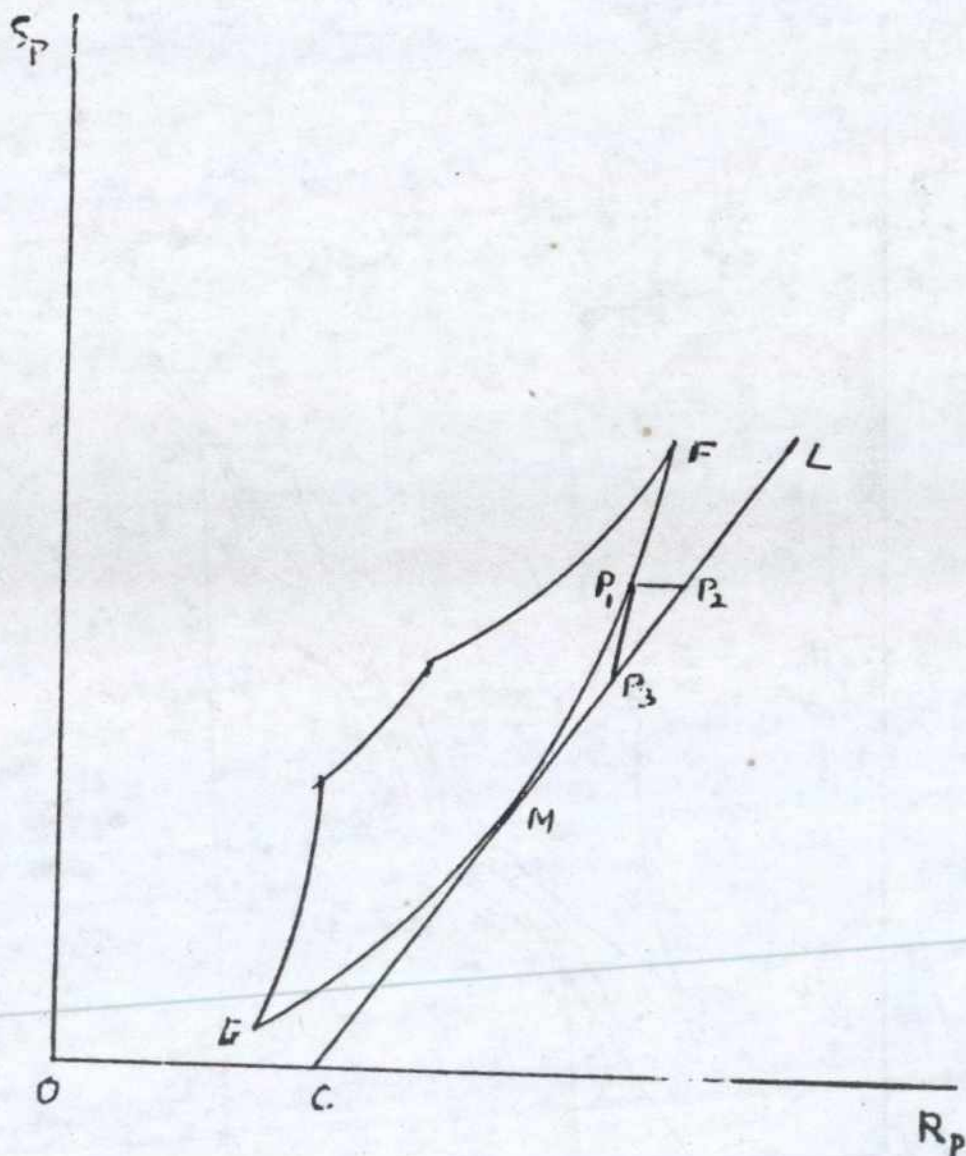


CHART 5.6

PORTFOLIO SELECTION

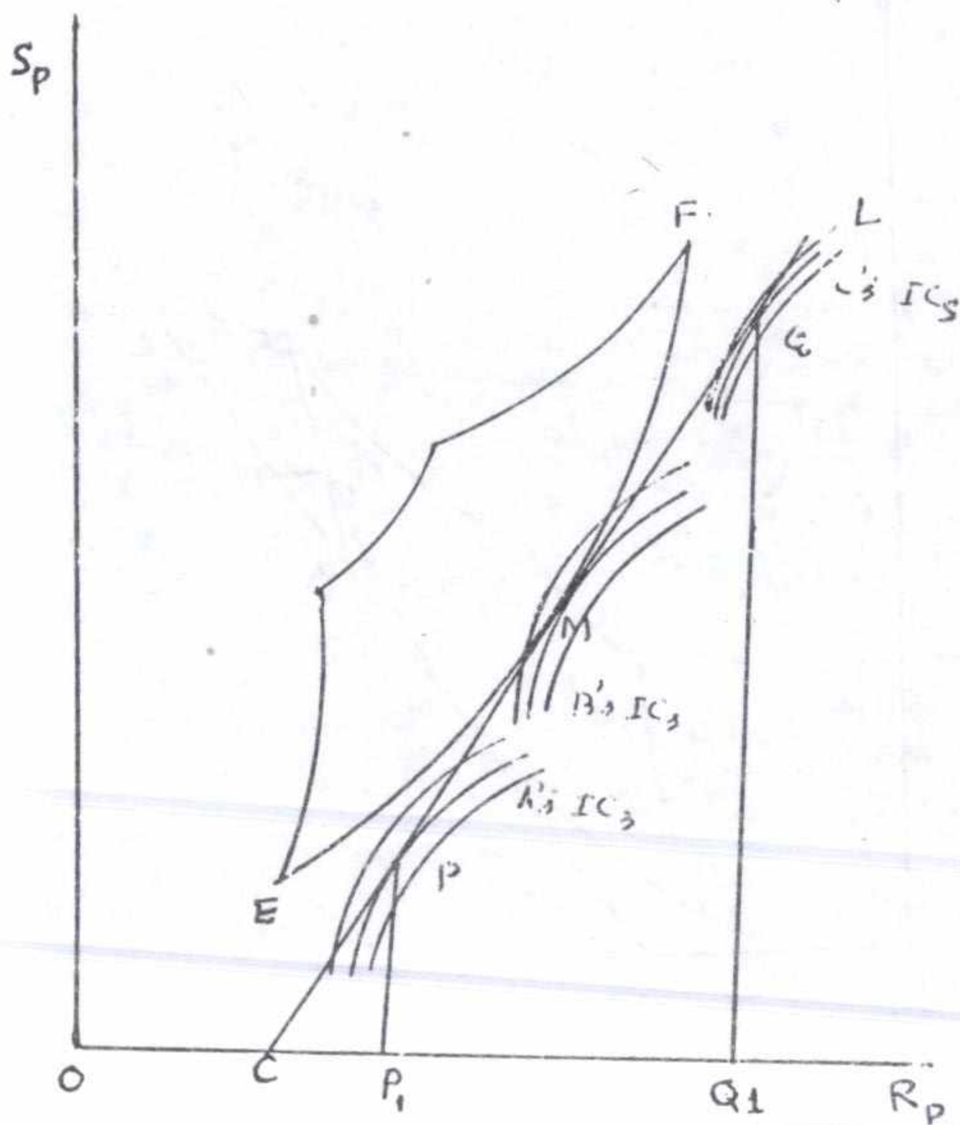
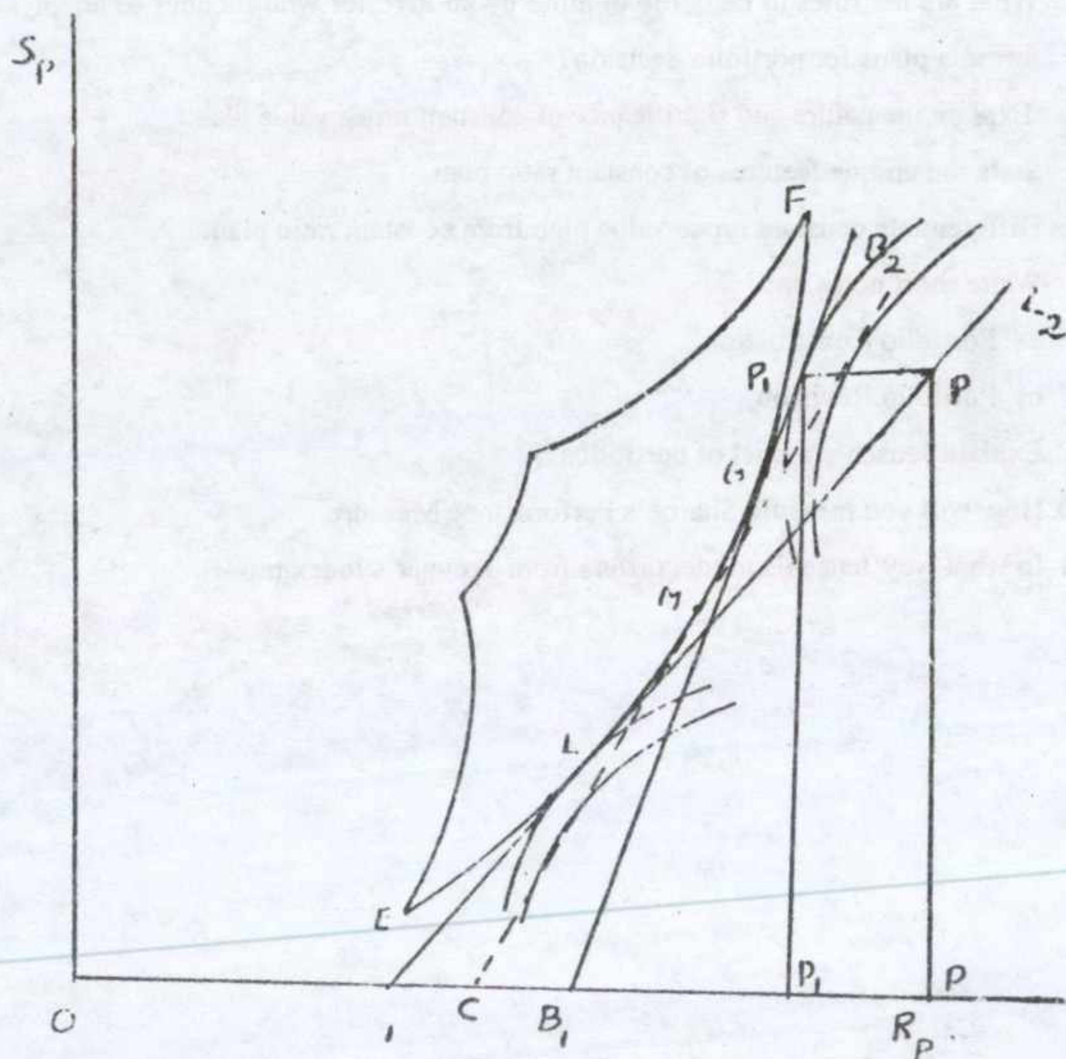


CHART 5.7

PORTFOLIC SELECTION

(Lending and borrowing rates difference from Risk free Return)



QUESTIONS

1. Do formula plans facilitate the investors in choosing appropriate securities?
2. Bring out the distinction between Sharpe and Treyner indexes of Portfolio performance.
3. "Formula Plans overcoming his emotional involvement with the timing of purchase and sale of stock – Explain the statement highlighting the significance of formula plans.
4. What are the rules to be borne in mind by an investor who inclines to adopt formula plans for portfolio decision?
5. Explain the nature and significance of constant rupee value plan.
6. State the unique features of constant ratio plan.
7. Differentiate constant rupee value plan from constant ratio plan.
8. Write short notes on:
   a) Portfolio Construction
   b) Portfolio Revision
9. Explain Jensen's model of portfolios.
10. How will you measure Sharpe's Performance Measure.
11. In what way Jensen's model differs from Treyner's index model.

Model Question Paper MFC Degree Examination

4.2. Invest Analysis and Portfolio Management

Time: 3 Hours **Max. Marks: 100**

(5 x 8 = 80 Marks)

Part – A

Answer any Five of the following questions:

1. Give the objectives of investment.
2. Distinguish between investment and speculation
3. State the features of fixed incomes securities.
4. State the merit of fundamental analysis
5. Explain the concept and significance of Portfolio Management.
6. How does diversification leads to reduction in risk?
7. The efficient frontier of Markowitz diversification cannot have a dent. Prove.
8. Explain the relationship between APT and CAPM

Part – B

Answer Any four Questions **(4 x 15 = 60 Marks)**

9. Explain different concepts of return and the measures of the same
10. Explain Dow theory and its uses.
11. What is technical analysis? Explain its tools and assumptions
12. Explain the Sharpe, Treynor and Jensen's measures of portfolio evaluation.
13. Compare and contrast CML and SML.
14. Are markets efficient? What are the factors influencing EMH?

15. Three securities have the following features:

Securities	a_i	b_i	e_i	S_{ei}
1	4	1.8	3.8	12.2
2	3	2.2	4.2	6.93
3	5	1.7	5.1	7.8

The securities are sensitive to industrial production and growth rate in industrial production is 8% with std. deviation 4%. Find the return, variance and covariance of securities and return and risk of the portfolio comprising 20% of 1, 50% of 2 and 30% of security 3.

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